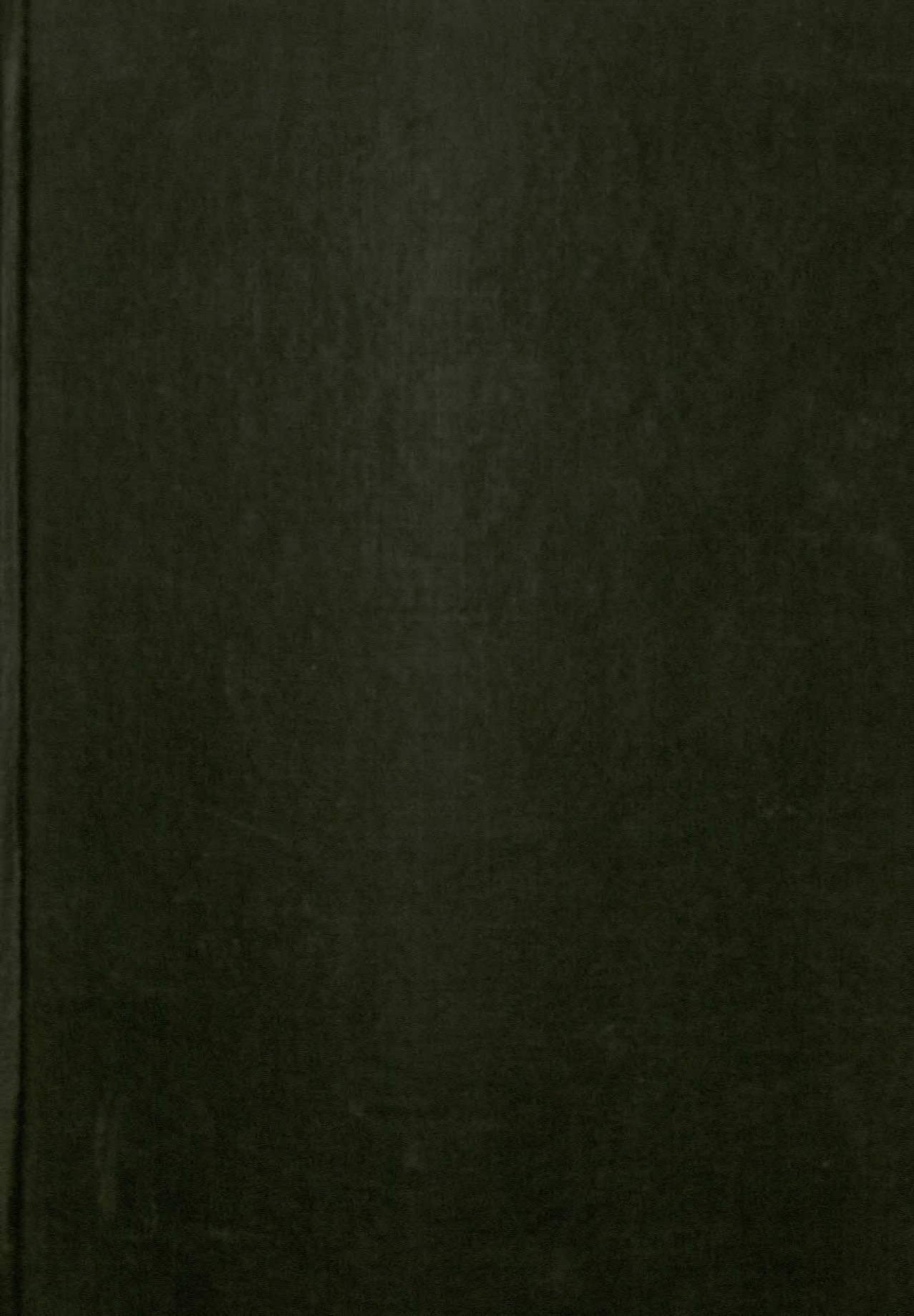






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PSYCHOLOGY AND TEACHING

Third Edition

PSYCHOLOGY AND TEACHING

and Education

PSYCHOLOGY AND TEACHING

Third Edition

William C. Morse G. Max Wingo

University of Michigan

SELECTED READINGS *Primary source materials of special interest*

REFERENCE MANUAL *Elements of General Psychology*

JAMES W. HALL, *Northwestern University*



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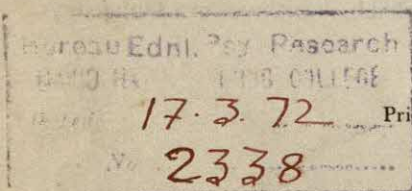
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AUTHORS' PREFACE

Throughout our lives we learn from our experiences. It is through experience that we develop styles of seeing, hearing, feeling, and doing. It is through experience that we form our values and attitudes and fashion our unique view of the world and our place in it. We learn most from those experiences in which we are most fully involved—involved with all our senses, our ideas, purposes, and feelings. In our judgment, this is learning in the fullest sense of the word.

Very often people think of “learning” as simply the mastery of facts and skills. Many students start their preparation for teaching with this conception and of course are reinforced in it by their college classes. Consequently, they come to teaching equipped to instruct in content and skills but not to guide the child’s experiences toward that involvement of self which marks broader learning.

We think teachers should be prepared for this larger role. And our experience indicates that the most effective way to prepare a teacher for this role is to have him learn in the way he will be expected to teach. There is an old adage to the effect that “people tend to teach as they were taught and not as they were taught to teach.” We believe there is considerable truth in this and so we have taken the position that if the richest learning grows out of compelling experience; then provision needs to be made for a base of such experience—for the teacher in preparation as well as for his students in future years.

Some time ago we concluded that this idea called for a new kind of textbook. And so in the earlier editions of *Psychology and Teaching*, we took our readers into many classrooms where they could make their own observations. They could see what children do at different stages of their growth and in different classroom situations. Further, they could see what pupil behavior seemed to follow from different teacher approaches. We stressed the importance of first-hand observations in the community and devised various activities which could be carried out by individuals or groups. It was our purpose to broaden the base of personal experience from which conclusions about good teaching could be drawn. Then, in the remainder of the text we tried to help the reader analyze and organize his observations and build his own principles of teaching and learning.

Our own experience, together with the comments of others who have used this book, has convinced us that our original idea was sound. Accordingly, in this third edition we have retained our original design with its emphasis on the experience of the student. However, we also have made important changes in organization and in updating and expanding the psychological material.

The main body of the text is now in five parts. The first part is concerned with the role of the teacher. Four schools are visited in a search for the purpose behind education and behind different approaches to teaching. References are made to this anecdotal material in later chapters to illustrate certain points in the psychology of teaching.

The second part is made up of three chapters on the developmental process in childhood and adolescence. This section provides a common background which

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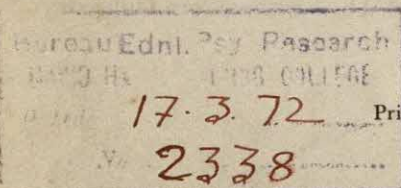
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The second part is made up of three chapters on the developmental process in childhood and adolescence. This section provides a common background which

we think is important for all teachers. In addition we recommend investigation by each student of sources related to the age level at which he plans to teach. To this end, specific sources are suggested both here and in later chapters for those who plan to teach young children, for those who plan to teach at the elementary level, and for those who expect to be high-school teachers.

Part three is concerned with the learning process. In this section we examine the psychological principles that are central to the learning process and relate these to teaching situations and to the major problems of teaching and learning.

The fourth part deals with factors that favor or hinder learning, particularly such factors as motivation and readiness for learning, discipline, and the emotional and social problems of students.

Part five, the concluding section, is concerned with problems of retention and transfer and evaluation of the total teaching-learning process.

In this book we are concerned with the relation of the science of psychology to teaching. Many of the contributions of psychological research are woven into the fabric of the book. However, there are concepts from general psychology that are not directly relevant to educational psychology and whose consideration would interrupt the main stream of development if they were included. Further, to incorporate them into the book would entail repetition for those students who have already had work in general psychology. Yet we think these concepts should be a part of the background of a teacher, and in some cases the educational psychology course is the student's only formal encounter with psychology.

To cope with this problem we have concentrated in the body of the book on the unique concerns of prospective teachers. Then in a Reference Manual at the back of the book we have provided a condensation of material usually covered in introductory courses in psychology. This section will be valuable for those who have not had a course in general psychology as well as for those who need a ready source for reference or review.

At the end of every chapter we have included a journal article, a research report, or an excerpt from a book. The purpose of these Readings is to extend the student's understanding of ideas with which the chapter deals and to acquaint him with the kind of primary source material on which educators base their recommendations designed to improve teaching procedures.

Some who read this book may already be teachers and others may be taking a course in educational psychology as a kind of exploration of a vocational field. However, we have written it primarily for those college students who expect to become teachers. We hope that all who read it will be better teachers for having done so.

William C Morse

Gruening—

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RESOURCES FOR STUDENT RESEARCH

In writing papers, students often spend more time locating the material they need than they do in digesting, reacting to, and organizing it for presentation. Below are several resources that can save your time by steering you toward the data you are looking for.

<i>Psychological Abstracts</i>	Published six times a year. Contains abstracts of all current psychological literature under special headings, including <i>Educational Psychology</i> . Has an annual index.
<i>Review of Educational Research</i>	A periodic review and digest of the contemporary research in the major areas of education. Each chapter written by a specialist.
<i>Child Development Abstracts</i>	Fairly extensive abstracts of the published research in child development. Published three times a year.
<i>Educational Index</i>	A "Reader's Guide" to the current publications related to education.
<i>Annual Review of Psychology</i>	Reviews the year's research in the major areas of psychology, including educational psychology. Citations are integrated into a running account of the major developments in each area.
<i>National Society for the Study of Education (NSSE) Yearbooks</i>	Contain some of the most thoughtful and scholarly writing in education by leaders in the various fields. Present a point of view as well as an evaluation of the literature in the field. Two areas covered each year.
<i>Buros Mental Measurements Yearbooks</i>	These volumes describe and evaluate all the standardized tests, giving sources, critical reviews, and pertinent data.
<i>Encyclopedia of Educational Research</i>	A massive compendium of education, past and present. Each article is written by an expert; contains divergency as well as consensus. Articles usually include very well-selected bibliography. Many excellent journals report research and current thought on all phases of teaching and learning. In this course, those you find most useful will undoubtedly include <i>Journal of Educational Psychology</i>, <i>Journal of Experimental Education</i>, and <i>Journal of Educational Research</i>.

Part **I**

LOOKING AT TEACHING

*The Complex We Study
What Goes on in Schools?*

LOOKING AT TEACHING

The Journal of the
National Council of Teachers

THE COMPLEX WE STUDY

WHERE THE ACTION IS

The “action” of educational psychology is to be found not in the nature of the subject itself but rather in its application—in the classroom. Teachers deal primarily with groups of children, not with psychological theory or experimental results. Their learning is constantly being applied to a unique set of circumstances. This is why teaching is a profession and not a trade. As every situation in which a physician must apply his knowledge is unique, and as a lawyer selects that from the past which has a unique bearing on the present, so does the teacher take from his stock of knowledge that which is pertinent to the present context. The variance from moment to moment in the classroom excludes the possibility of rote solutions.

The elementary classroom may have 15 to 56 pupils, the average being 30. In secondary schools within large school systems the range is from 14 to 40, the typical size being 28 (except in special areas such as physical education, where class size may run as high as 66).¹ And the pupils will be far from identical even in rough chronological age, let alone other significant characteristics. The rule of thumb is that the range in any attribute—say, reading ability—will be two thirds the chronological age. Thus, in a class of nine-year-olds, there may be a six-year variation in certain abilities. This does not mean, of course, that one pupil will be at the bottom of the continuum in all areas and another always at the top. In spite of teacher efforts to see that all pupils learn the same things, the longer they are in school the more dissimilar they become. While some classes, particularly in the high schools, have what are termed *homogeneous groups*, the selection is made on one variable and there will still be wide variation between individuals.

Thus it is that the classroom comprises a myriad of factors. Each participant—be he child or youth—brings his own unique life history. Each is at a particular point on his way to maturity. Given certain abilities, past experiences,

¹Details may be found in publications of the National Education Association Research Division. See *Class Size in Kindergartens and Elementary Schools, March, 1965* (Research Report 1965-R11. Washington, D.C.: the Association, July 1965) and *Class Size in Large City School Systems, 1966-67* (Educational Research Circular No. 4, 1967. Washington, D.C.: the Association, July 1967).

and motivations, some are ready for the task of the day. Others are present, but without any such readiness. And the business of the classroom may be as specific as learning the process of osmosis or how to spell "cat" on the one hand, or as diffuse as understanding the meaning of "democracy" on the other. The goal may be to acquire skill in getting a basketball through the hoop or in representing with water colors a scene from memory. This classroom may be in a consolidated district where many ride over an hour each way by bus. It may be in the midst of urban congestion. Or it may be located in sprawling suburban architectural splendor. Resources may consist only of worn-out textbooks, or they may include the latest in learning laboratories and closed-circuit television. The common denominator in all of this is that each classroom has a teacher, and that each teacher knows how to make the specific use of psychology which is appropriate.

To discover what makes teaching effective and what makes learning effective, we need the help of several special areas of psychology. Beginning less than a hundred years ago as the study of "mental states," psychology has grown to a science which today is concerned with virtually all aspects of human behavior. Four general areas of this broad science are of special interest to the teacher: the psychology of development, the psychology of learning, the psychology of motivation, and the psychology of group behavior.

From developmental psychology the teacher learns about human growth from infancy (and even before) to maturity—how physical, intellectual, emotional, and social potentials mature and change as a child grows; what conditions foster healthy growth; what conditions block it. Many changes in teaching method and curriculum have come about as more has been learned about the ways in which children typically develop and how their needs change. Another focal point of attention has been the special problems of the child who is "different" in some way.

The psychology of learning is concerned with how we acquire and change our patterns of behavior, how this process takes place most efficiently, how learning of different kinds can be measured, what conditions help us retain what we learn and use it appropriately in new situations, and how learning varies with different levels of ability. Many kinds of learning "content" are involved in schoolwork—from simple muscular responses to highly complex intellectual processes. A teacher's need for studying the psychology of learning is obvious.

The psychology of motivation (sometimes called dynamic psychology) is the psychology of why we do what we do—the study of our goals, purposes, fears, ambitions, and needs. Knowledge of the mechanics of learning will avail nothing if the teacher does not also know how to get students to *want* to learn. This means having some understanding of the factors, conscious and unconscious, that determine the direction of pupils' actions and the amount of effort they are willing to put forth.

A part of the general field of dynamic psychology is the branch concerned with mental health. A child suffering from serious emotional or social maladjustment is not free to use his full potential for learning and may be a disrupting influence in the classroom. Today more than ever we are aware that mental health is a concern of the school. Many a teacher has found that the most difficult problems in his job have grown out of children's emotional needs rather than out of learning difficulties—though one has often brought about the other.

Group psychology is concerned with the ways in which an individual functions when he is acting as part of a group. Since the teacher is a group worker, the findings of group psychologists are very important to him. For a long time, educational psychology emphasized the individual alone—how the individual learns, the differences between one individual and another. It was almost as if the teacher were to tutor first one student and then another. But pupils do not go to school in a social vacuum. The social aspects of school life are to some children the most significant part of school, and the same learner will behave and learn very differently in different social settings. The learning sought by the teacher can be facilitated or completely hamstrung by the organization and climate of the group. Thus, a good teacher needs to understand group factors and how to work with them.

It becomes evident that modern psychology offers a great deal of help to a teacher in his attempts to understand children and how they learn. Yet two cautions are in order. One concerns the application of research findings to the classroom; the other, the application of clinical theories.

In seeking to apply research findings, one must be critical of accepting everything that "research" is claimed to have established. If you look up the report of a study claiming to show the superiority of a new method of teaching spelling and find that only fifteen subjects were used, that they were tested immediately after the learning but that the retention and use of the new words in their writing were never checked, and that three of the group did not do as well as those who learned by conventional methods, you would regard the claim as something less than a universal generalization.

Even when the conclusions of a study seem justified for one group of subjects under one particular set of conditions, they may not be applicable to other subjects under different conditions. It is especially risky to assume that laboratory findings necessarily apply to the classroom situation. If college students in a laboratory experiment learn nonsense syllables better in short trials spaced two minutes apart than in one continuous session, can we draw the overall conclusion that spaced learning is more efficient than massed learning, and, therefore, elementary school children should have fifteen minutes of geography each day instead of an hour and a quarter once a week? Before we can apply any such generalization, we need to know who was learning, how far apart the spacing was, how long the trials were, and what type of material was being learned. In applying research findings to a new situation, we always need to ask whether the subjects and other relevant conditions are comparable enough for us to expect the various factors to operate in the same way. Nevertheless, familiarity with current research can alert the teacher to many ramifications of learning that might otherwise pass unnoticed.

The other caution concerns the application of clinical findings. Unfortunately, many of our concepts of emotional growth and mental health have been derived from work with maladjusted people. We are still in the process of finding out the extent to which the concepts and the methods that are useful in dealing with troubled individuals are also suitable for those who do not have serious difficulties.

While there will be certain overriding generalizations, each teacher will concentrate on those aspects of psychology which are most applicable to his needs. The nursery-school teacher will concentrate to a greater degree on the

development of three- to five-year-olds, while the junior-high teacher focuses on early adolescence. Group interactions differ at different ages, and teachers meet pupils in groups. Psychology is helpful to the teacher to the degree that it illuminates classroom phenomena and enables him to be an effective manager of the



Being a teacher can mean many things. It can mean helping a six-year-old begin to realize how words are put together. It can mean helping large or small groups of teen-agers master anything from office skills to art appreciation. It can mean helping youngsters of any age, anywhere, learn almost anything. What does it take to be a good teacher? There are as many aspects to this question as there are classrooms, and researchers have found no easy answer to it. But experience has shown that for those who pursue the goal of excellence, the field of teaching will prove exciting, challenging, and extremely rewarding.

classroom complex. This is why it is essential for the prospective teacher to begin at once to develop accurate perceptions of what classrooms are like, using recall from past experience, examples in the text, and visits to actual classrooms.

There are a great many exciting things going on today in educational psychology, as there are in education in general. Three primary factors are involved. One is the alteration of the curriculum with the "new math," the "new science," and so on. The second is the stimulation of educational research and training through the efforts of the federal government. As educational programs, curriculum, and purposes change, educational psychology must keep up. In the third place, educational psychology has recently found itself in the main stream of the science of psychology, a position it has not enjoyed since the early nineteen hundreds. How to teach and how children grow and learn is less and less the private domain of the educator; psychologists from many fields are actively engaged in research and theoretical work both in the laboratory and in the classroom. As we shall see, there is wide divergency between the points of view of those who, like B. F. Skinner, would have us focus on specific responses and how they can be reinforced to facilitate learning, and those like J. S. Bruner who direct our attention to motivation, concept formation, and the development of mental processes. One of the questions we must keep in mind will be whether, as teachers, we can depend entirely on one point of view or whether we will need to draw our insights from many different approaches.

Educational psychology today is anything but a cut-and-dried compendium of accepted knowledge. A student who finds security in a list of memorized maxims is likely to be made uneasy, while the student who enjoys mental effort and is ready to explore the edge of understanding will find much to stimulate him.

ELEMENTS OF EFFECTIVE TEACHING

The obvious goal of every member of the teaching profession is good teaching. No educational topic has engaged more attention from ancient times to the latest professional journal. Unfortunately, despite all that has been spoken and written, we still are hard put to explain what good teaching really is.

Traditionally, teaching has been looked on as the process of imparting to the learner the knowledge and skills required to master prescribed subjects. Success for teacher and learner has been measured in terms of the student's ability to answer the teacher's questions about such subject matter.

A dictionary definition goes a little further than the traditional concept. It defines teaching as "to show how to do; make understand, give instruction to." But this definition, although accurate, leaves out the *what* and the *who* and the *why* of teaching.

Teaching has come to mean much more than it once did—more than any dictionary definition. Today teaching means the understanding and guiding of children as individuals and as groups. It means the providing of learning experiences that will enable each learner to grow continuously and sequentially toward his own adult role in society.

Good teaching must be defined in terms of the goals of the teaching process, and these goals are usually multiple. For example, we want pupils to learn certain facts and skills, to develop a set of values, to think and act independently—while at the same time being cooperative, of course—and so on. We also hope that they will not only learn history but become good citizens, making wise use of their right to vote. As we shall see in the next chapter, administrators, teachers, pupils, parents, and the community at large will all have their own ideas about the purposes of the school's activity. Thus philosophical issues are closely bound in with any concept of good teaching. It is always good teaching toward some end.

The role of the American teacher has been undergoing a metamorphosis in recent years.² The overall emerging goal is that of teaching pupils how to learn. The teacher has ceased to be primarily a dispenser of information. The tutorial function is replacing the didactic; the teacher is no longer a source, but a resource. The intellectual demands are increasing: some used to look down on preschool education as glorified baby-sitting; now this period is seen as the key to language development, creativity, and conceptual thinking. In fact, this is one of the most rapidly growing areas of experimentation and theory today. At all levels, then, teaching is more and more a matter of professional understanding.

What makes a "good" teacher?

In trying to get at what is meant by "good teaching" perhaps it would be well to begin by recalling your own past experiences. Some of your teachers may have been effective, some poor. But even the effective ones were not all of one mold, nor did they teach in identical ways. In fact, if you think of your two best teachers, it is likely that you will find they had very different styles.

It is interesting to note that there is a good deal of agreement between formal administrative evaluations and informal judgments by parents, fellow teachers, and nonadministrative school personnel as to which of the teachers in a given school are outstanding (Hawkins and Stoops, 1966). A number of studies have been made of the personal characteristics of good and poor teachers. Perhaps the most comprehensive series of studies is that conducted by Ryans (1960), who studied the characteristics of two groups of teachers who had been designated as "good" or "poor" on the basis of ratings by trained observers on twenty-two dimensions of classroom behavior. Some of the typical differences in observed behavior are shown below.

GOOD TEACHERS	POOR TEACHERS
Warm, understanding, friendly	Aloof, egocentric, restricted
Responsible, businesslike, systematic	Evading, unplanned, slipshod
Stimulating, imaginative, surgent	Dull, routine

²See "The Changing Role of the Teacher," by Gordon C. Lee, Chapter 1 in *The Changing American School*, N.S.S.E. 65th Yearbook Part II (Chicago: National Society for the Study of Education, 1966).

Through direct questioning, ratings, observation, projective tests, and analysis of background information, Ryans found a consistent pattern in the differences between the two groups despite the expected individuality in personal traits. He found that,

"For elementary and secondary teachers combined . . . there was a general tendency for high teachers to be extremely generous in appraisals of behavior and motives of other persons; possess strong interest in reading and literary affairs; be interested in music, painting, and the arts in general; participate in social groups; enjoy pupil relationships; prefer nondirective (permissive) classroom procedures; manifest superior verbal intelligence; and be superior with respect to emotional adjustment."

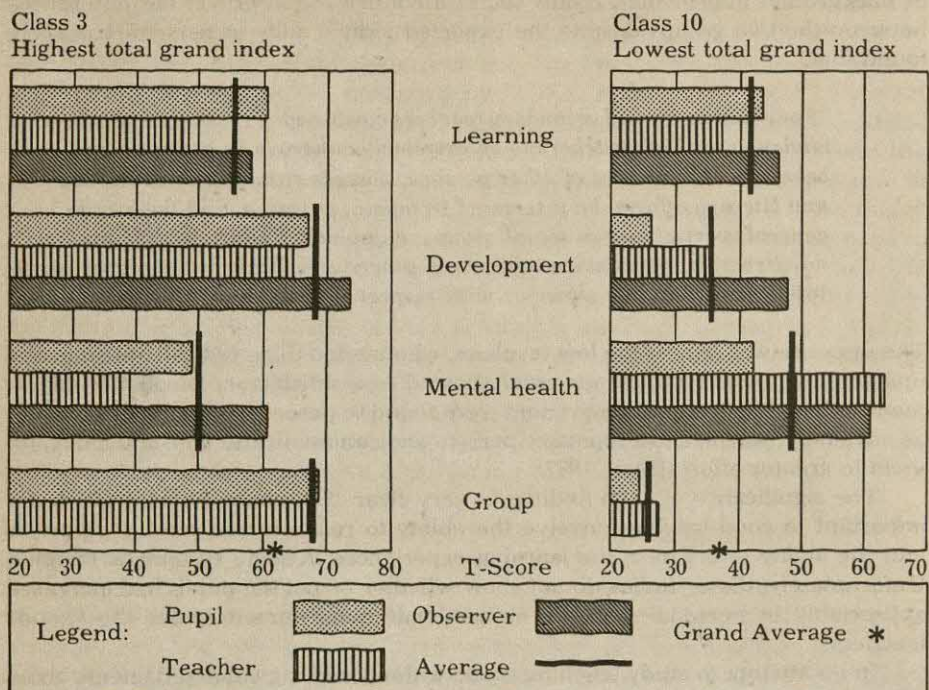
The opposite was true of the low teachers, who tended to be critical, unsocial, and unfavorable toward pupils and who showed less satisfactory emotional adjustment. In another study, sixth-graders were found to perceive the effective teacher as a friendly, warm, and supportive person who communicates well and motivates them to greater effort (Beck, 1967).

The significance of such findings is very clear. The characteristics which are important to good teaching involve the ability to relate to and work with pupils and the ability to organize the learning experiences in some systematic manner. Unfortunately, these studies do not show whether or not the pupils had increased appreciably in personal maturity or academic achievement under the "good" teachers.

In an attempt to study teaching styles without making value judgments about "good" and "poor" teaching, a study was done to assess the degree to which teacher statements of preferred practice corresponded to ratings of their actual practice along four dimensions: achievement, group work, provision for individual differences, and mental health considerations (Morse, Bloom, and Dunn, 1961). Obviously, different teachers put differing amounts of stress on each of these aspects. Teacher practice was rated both by pupils and by trained observers. The ratings obtained in two of the classes studied are shown on page 10. The results were surprising in several ways. Teacher philosophy, preferred practice, and actual practice were virtually unrelated. While observers and pupils saw somewhat similar classroom conditions, their perceptions were unrelated to what the teacher thought was happening. On the whole, pupils showed a tendency to see the class as either high or low on all four dimensions. Some classes, however, gave greater emphasis to one dimension. (It must be remembered that these are averages, and individual pupils might show a wide range of opinions.)

Some of the pupils were interviewed in classes which appeared to differ from each other. Two interesting things emerged from these interviews. The pupils tended to rate a teacher as good on such matters as "She helps us learn" even if she was considered tough, or "She cares about us" even if the lessons were somewhat confused. Thus there were wide differences in the elements the pupils used for judgment: there were many ways to be a good teacher. But let the teacher be too near the extreme on one dimension—"mean" rather than merely "strict," "chaotic" rather than merely "lax," "arbitrary" rather than merely "quite demanding"—and the pupils would overlook what was positive in the classroom, giving the teacher a low rating on all dimensions. The good things were lost to the

PREFERRED PRACTICE VS. ACTUAL PRACTICE



(from Morse, Bloom, & Dunn, 1961)

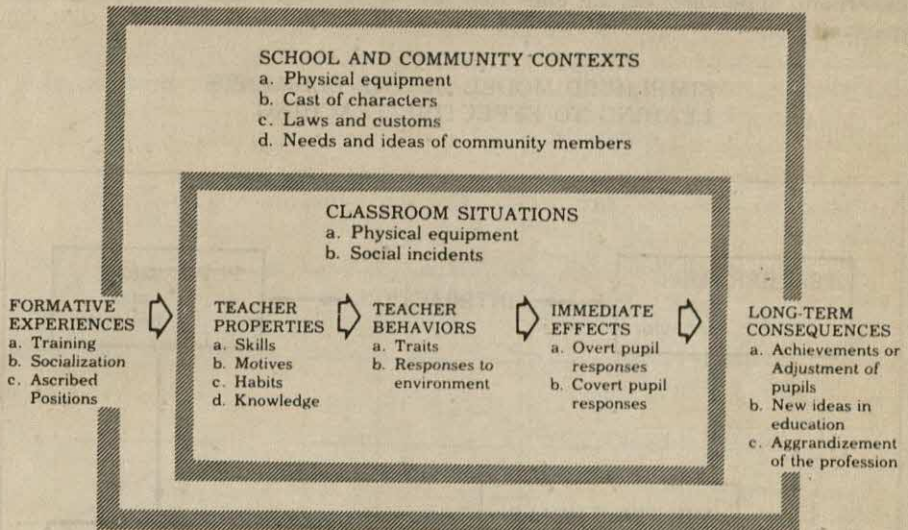
strong negative aspect. The important thing is that the pupils were tolerant of a wide range of variation unless it became too extreme. This has encouraging implications for teachers. We need not all be cast in the same exalted mold to be good teachers."

Seeking a model for effective teaching

Let us see if we can set up a model that will help us in our attempt to work through the problem of effective teaching. We have started with the idea that teaching style evolves from the nature of the teacher. But dimensions of teacher personality are hardly a sufficient basis for making clear the nature of effective teaching. N. L. Gage's impressive *Handbook of Research in Teaching* (1963) brings together a mass of research and theory on all aspects of the process of teaching, yet it does not resolve the issue of the nature of effective teaching. Despite the progress that is being made we are still a long way from resolution of this crucial matter.³

³For an interesting discussion of problems, see "Evaluating Teacher Effectiveness: A Review of Research," by Kaoru Yamamoto (*Journal of School Psychology*, 1963, 2, 60-71). A recent volume which concentrates on specific approaches ranging from role analysis to teacher-pupil interaction studies is *Contemporary Research on Teacher Effectiveness*, edited by B. Biddle and W. J. Elena (New York: Holt, Rinehart & Winston, 1964).

A SEVEN-VARIABLE-CLASS MODEL FOR TEACHER EFFECTIVENESS



(from Biddle, 1964)

This diagram shows how the past experiences of the teacher interact with specific classroom situations in the general framework of the community at large. The listings under the different classifications are but a few examples of the factors involved.

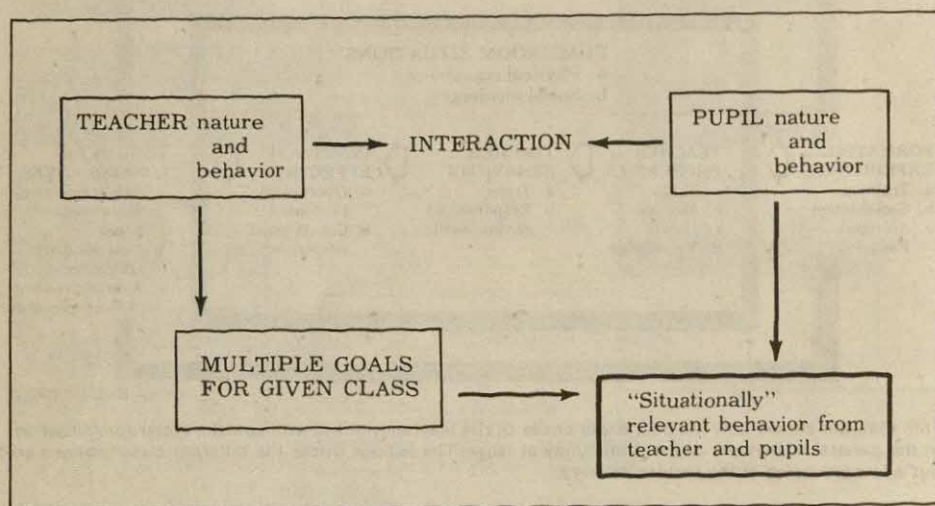
One of the more encompassing and yet not too complex diagrams, developed by Biddle (1964), is shown here. Much of the material that we have been dealing with in this chapter comes under the category of "teacher properties." A little later on we shall look at one device designed to analyze some of the "teacher behaviors" (see p. 17).

Since we are seeking a simplified model, however, let us confine our discussion to the classroom itself. As we saw earlier, the activities of the classroom have some intent or purpose, for which the teacher is responsible. Can the pupils and the teacher interact in ways which will achieve this purpose? What is needed will vary from one class to another, and in the same class at different times. From this point of view, the effectiveness of teaching is determined by whether or not what happens to pupils is in keeping with particular goals for a particular classroom. Thus it does not imply one and only one way of operating. Even with the same essential goals, the nature of the teacher and the nature of the class and its members will necessitate particular styles and methods of reaching for those goals (Gehman, 1964).

It appears, then, that three major elements must be taken into consideration: the teacher, the pupils, and the goals. There is no way of discussing effective teaching without answering the question "Effective for whom and effective for what?" Thus in place of a magic model giving the profile of a perfect teacher, we have an interactive condition. Effective teaching is doing the appropriate thing for the individuals in a particular group to move them along toward specified goals. Such a pattern is shown on page 12. In the next chapter we shall look at some

examples which illustrate the wide range of behavior which can take place in the classroom, depending on the ends that are being sought and the pupil groups involved.

SIMPLIFIED MODEL OF THE ELEMENTS LEADING TO EFFECTIVE TEACHING



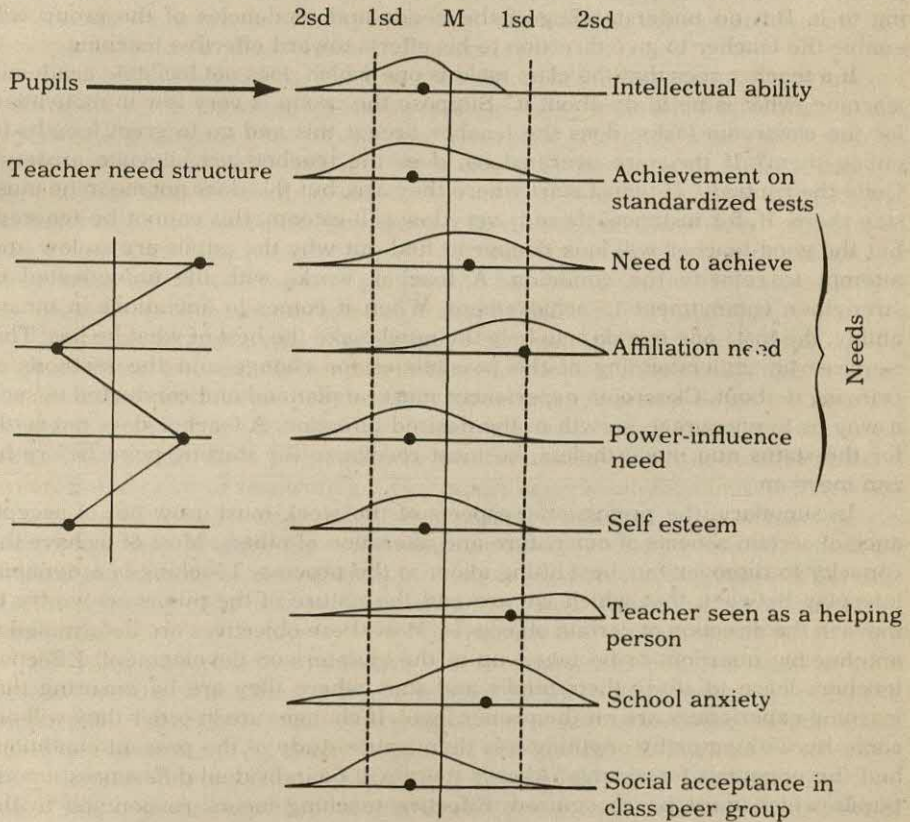
The pupils we teach

There is one element in our model of effective teaching that we have hinted at but not yet examined, and that is the pupils themselves. Just as teachers have characteristics which influence the interaction, so do classes. One class may be fun-loving, with little motivation to learn, while another is most anxious to achieve. A class may be resistant to discipline or it may be compliant. One group may have a high acceptance of one another while another has many mutual antagonisms. Obviously, such matters have a bearing on what constitutes effective teaching in a given situation.

It would be impossible to assemble all of the "nature of the class" dimensions, just as it is difficult to identify all the relevant dimensions of the teacher's nature. A recent study investigated twenty-three dimensions other than the usual ones of age, intelligence, and achievement (Ketcham and Morse, 1965). These dimensions have been standardized for the sake of comparison, and measures based on an illustrative class are plotted in the figure opposite. Comparable measures for the teacher are given where applicable. While this is something of an oversimplification, it does exemplify what is involved in the interaction. It is really a conceptual system to use in working with the model.

It must always be remembered that, regardless of the general tendency of the

class on any variable, there will be individual differences. Most classes show a wide range of variation on almost every dimension. In fact, the very form of the distribution may be important. In the example cited, although the class averaged below normal in ability, there is a good-sized group with above-average ability. There are wide differences in perception of the teacher as a helper; some are



These children are evidently not quite as bright as average, and their achievement is somewhat under expectation for their ability. They are considered by the school to be somewhat dull, but it is clear that they do want to achieve. They are low on the desire to dominate or lead others; this is reflected in a lack of leadership within the group. They are high on need for affiliation but this need apparently remains unfulfilled; there is less social acceptance than in the typical class. Considerable demands are made upon the teacher for support. Their self-esteem is low, and they are very sensitive to criticism. They tend to give up readily and feel like "a bunch of dopes." School is for them a situation fraught with tension and anxiety. The normal inclinations of the teacher, however, are to press for achievement; he is annoyed by the pupils' drive toward socialization, which interferes with what he considers the real purposes of the classroom. The fact that there is considerable peer friction does not concern the teacher very much. He "rules with a strong hand" and the pupils accept this, although it does not help them develop leadership ability. As can be seen, the teacher himself is somewhat insecure; some of his behavior might be defense against inner inadequacy.

near the positive end of the scale and others very unaccepting of this aspect of the teacher's role. This latter group is "lost" when we look only at the average. Students differ markedly in most important characteristics and the effective teacher must not only sense the group tendency but be aware of individual needs as well. One must respond to individuals as well as to the average.

What we have been saying about the nature of the class does not mean that a teacher should attempt to transform his basic style of teaching to conform to the pattern of a particular class. Understanding the group does not mean surrendering to it. But an understanding of the needs and tendencies of the group will enable the teacher to give direction to his efforts toward effective teaching.

If a teacher sees that the class mold is one which does not facilitate academic learning, what is he to do about it? Suppose the group is very low in motivation for the classroom tasks; does the teacher accept this and go to great lengths to entice them? If they are overanxious, does the teacher just alleviate anxiety? Quite the contrary. He must *start* where they are, but this does not mean he must stay there. If, for instance, there is very low self-esteem, this cannot be ignored, but the good teacher will look deeper to find out why the pupils are so low and attempt to remedy the condition. A teacher works with the unmotivated to strengthen commitment to achievement. When it comes to limitations in innate ability, the most one can do is to help the pupil make the best of what he has. This requires an understanding of the possibilities for change and the methods of bringing it about. Classroom experiences must be planned and conducted in such a way as to encourage growth in the desired direction. A teacher does not settle for the status quo; nevertheless, he must recognize the starting point before he can move on.

In summary, the professional aspects of the work must grow out of acceptance of certain aspects of our nature and alteration of others. Most of us have the capacity to discover our best-fitting idiom in the process. Teaching is a dynamic interplay between that which we are and the nature of the pupils, as we try to move in the direction of certain objectives. How these objectives are determined is another big question, to be taken up in the chapters on development. Effective teachers learn to study their pupils and start where they are by ensuring that learning experiences are on the proper level. If changes are in order they will not come by wishing or by anything less than astute study of the present conditions and the potentials for change. Always there will be individual differences among pupils which must be recognized. Effective teaching means responding to the reality of the classroom.

ON BEING A TEACHER

A passage from the work of Arthur Combs (1965) will sum up the things we have been saying about effective teaching:

As we have seen, research on the competencies has been unable to isolate any common trait or practice of good teachers. But this unanimous failure in itself demonstrates an important fact: a good

teacher is primarily a unique personality. . . . A good teacher is first and foremost a person, and this fact is the most important and determining thing about him. He has competence, to be sure, but not a common set of competencies like everyone else. . . . Apparently, there can be no such thing as a "good" or "bad" method of teaching. (pp. 6-7)

Combs goes on to say that each must search for his "personal idiom" and concludes that the effective teacher may be defined as "a unique human being who has learned to use himself effectively and efficiently to carry out his own and society's purposes in the education of others" (p. 9).

Combs sees the personal idiom as growing out of the way the neophyte teacher looks at his work: his views on what people are like, on how learning takes place, and on the purpose of the educational enterprise. He must also see himself as an able and responsible person. This is why it is important to make a positive identification with the field, so that there can be a personal involvement with the subject matter and with the youngsters. In a study of the interest patterns of student teachers, Schultz and Ohlsen (1955) found that the best student teachers were interested in working with people and had broad intellectual interests. The poorest ones were more interested in matters related to personal gain.

Of course, in any group of prospective teachers there is bound to be a wide range of characteristics. Motivations differ.⁴ Your reasons for becoming a teacher may be unique in this class, or they may be common to many. Some are here for reasons of expediency—it sounds like an easy route to a profession and earning a living. Others may have planned to be teachers since they first thought about a career. Some more or less wandered in; others eagerly sought admission. To some women, teaching and homemaking are a natural combination. Some men plan to teach while they prepare for some other career they really prefer. It would be simple if the reason for choice could be used to predict teaching success, but this, like the search for the one perfect style of teaching, would be based on a misconception.

Knowing why you chose to teach is less important than knowing what your personal resources are for the work, and the extent to which you can accept the responsibility teaching entails. Of course, one must not be absorbed in conducting a cold war with teaching. Some people do this openly: "I don't know what I'm doing here—I'll never be able to stand it." Frequently they don't stand it very long. Others, perhaps forced into the work by parental pressure or the lack of talent to do something they would prefer, may conduct covert opposition. While not wanting to teach can be the source of problems, the converse does not necessarily follow. Wanting to be an able teacher does not always make it so. Again, it is a question of evolving the skills required by the profession, though this is usually facilitated by a desire to teach.

While there is a wide latitude in patterns of acceptable teaching, it is not *carte blanche*. As Ryans found (see p. 8), there are certain overriding general attitudes which seem to be essential. Still, a teacher becomes effective as he learns to make

⁴A study of factors influencing the motivation of prospective teachers is reported by Takako Mori in "Analysis of Factors Influencing Motivation for Becoming a Teacher" (*Journal of Educational Research*, 1966, 60, 174-179).

the best of his own distinctive attributes. This brings us to the issue of how one becomes a good teacher. For it is well known that poor teachers can verbalize the nature of good teaching as effectively as good ones.

Taking oneself as a "point of beginning" is not simply a matter of semantics; it requires a degree of self-awareness which has to be cultivated. Few training programs provide much positive opportunity for systematic self-understanding.⁵ If we accept what Combs proposes, professionalism must begin with self-knowledge. Each in his own way becomes the most effective teacher he can be, making the most of his assets and playing down his limitations in keeping with his teaching goals. What, then, can the prospective teacher do to facilitate self-knowledge of this important type?

Perhaps the most readily available medium is the autobiographical sketch, including an examination of such matters as one's own self concept, major frustrations and satisfactions, and goals. Reflection upon these things often brings new awareness. Sometimes a knowledgeable friend or professor can help one ascertain the meaning of a life pattern. Every life style reflects the individual's basic motivations and the level of security he has achieved.

There are many scales, some general and some specific to teaching roles, which can be of help in self-examination. It should be emphasized that we are not here discussing personality as a whole, but only those attributes which bear directly on teaching. Such scales enable a person to construct his teaching profile. For example, the *Teacher Practices Questionnaire*⁶ has the following dimensions: advice giver, counselor, disciplinarian, motivator, or one who refers all problems to others. Another scale⁷ seeks to ascertain one's fundamental motivational patterns. Here the dimensions are the individual's concern for achievement, his need to be the center of the stage, his need to relate and affiliate with others, and his desire to help others. Individual teachers differ widely on such dimensions, and this is reflected in their teaching practices. For example, the disciplinarian thinks of *incentive* in terms of punishment while the motivator thinks of it in terms of reward. Each arranges classroom conditions in accordance with his ideas of how one really influences pupils, and each tends to follow his own bent in his interpersonal relationships. An achievement-oriented teacher focuses on high achievement as the desired outcome of every classroom activity, while the affiliative-oriented teacher strives for good interpersonal relationships. For him a friendly class is a good class; for the other a learning class is a good class. Incidentally, the need structures of teachers, counselors, and principals do not always coincide—a fact that may explain why they sometimes appear to be working at cross purposes (Kemp, 1964).

A basic factor which may underlie these specific dimensions and has much to do with one's flexibility in adjusting to various situations is the teacher's self-esteem or feeling of adequacy. Sometimes this is referred to as ego strength, the capacity to meet life. There are scales designed to measure this factor as well as the dimensions listed above. Persons with low self-esteem may be perpetually on

⁵The Bank Street School in New York City is one of the exceptions. Through small seminars and discussions as well as counseling, the emphasis on self growth is made the central focus of the teacher's training. Attention is given to the candidate's interpersonal qualities as well as to subject matter and teaching skills.

⁶G. Sorenson and Constance Yu, School of Education, University of California, Los Angeles.

⁷H. Gough, *Adjective Check List*. University of California, Berkeley.

SUMMARY OF CATEGORIES FOR INTERACTION ANALYSIS

Teacher talk	Indirect Influence	1. <i>Accepts feeling</i> : accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
		2. <i>Praises or encourages</i> : praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "um hm?" or "go on" are included.
		3. <i>Accepts or uses ideas of student</i> : clarifying, building, or developing ideas or suggestions by a student. (As teacher brings more of his own ideas into play, shift to category five.)
		4. <i>Asks questions</i> : asking a question about content or procedure with the intent that a student answer.
		5. <i>Lecturing</i> : giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions.
	Direct Influence	6. <i>Giving directions</i> : directions, commands, or orders with which a student is expected to comply.
		7. <i>Criticizing or justifying authority</i> : statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing, extreme self-reference.
Student talk		8. <i>Student talk—response</i> : talk by students in response to teacher. Teacher initiates the contract or solicits student statement.
		9. <i>Student talk—initiation</i> : talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10. <i>Silence or confusion</i> : pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

(from Amidon and Flanders, 1963)

the defensive, with little capacity to reach out to others. It is obvious why basic security is so vital to the teacher.*

While effective teaching requires considerable understanding of one's attitudes and motives, this is only a beginning. The person who would become an effective teacher must also know how he performs—his actual behavior. Feedback from pupils is one source of information. More formal devices are also available to help teachers see their own behavior more objectively. One such tool which has shown considerable promise for teacher training is the *Flanders Interaction Analysis* (Amidon and Flanders, 1963). This schema has been used in

*References which the student will find helpful in this area include "The Helping Relationship As Described by 'Good' and 'Poor' Teachers," by A. W. Combs and D. W. Soper (*Journal of Teacher Education*, 1963, 14, 64–67); "A Factor Analysis of Preferences in Teacher Role Behavior," by E. J. Furst (*Journal of Experimental Education*, 1965, 33, 379–382); and "The Image of High School Teachers: Self and Other, Real and Ideal" (*Journal of Educational Research*, 1965, 59, 99–105).

training new teachers and in retraining experienced ones. The verbal interaction of the classroom is recorded by an observer; each response of teacher or pupil is coded according to the categories listed in the table. The technique can be carried out by teacher teams, one observing while the other teaches and then the reverse. The sequential patterns of teacher-pupil behavior indicated by the specific responses can then be studied. Teachers can learn to respond in a manner which will produce the desired results once they have evidence that their present behavior is in need of alteration. Since this is a system for recording verbal behavior, there is of course much which is not recorded. The tone and feeling generated by the teacher are most difficult to codify and yet of great importance in determining the emotional impact of words on the pupils. There is also the matter of the "self-fulfilling prophecy." Pupils tend to respond in the manner that is expected of them, and the teacher's unspoken expectations of success or failure, cooperation or misbehavior play a part in what goes on in the classroom (Rosenthal and Jacobson, 1968).⁹

Nonetheless, Flanders presents one excellent tool for analyzing performance in more concrete terms than has been usual in the past. Such information enables a teacher to direct his efforts at change toward positive ends. One cannot make systematic changes unless one knows what needs changing.

Reading

Robert Rosenthal and Lenore F. Jacobson

TEACHERS' EXPECTANCIES: DETERMINANTS OF PUPILS' IQ GAINS

"Everybody knows" that disadvantaged children just aren't able to do as well in school as their middle-class counterparts. Sometimes this is ascribed to inherent lack of ability, sometimes to cultural deprivation, but teachers and school administrators generally agree that these children are somehow "different." Robert Rosenthal, a Harvard psychologist, and Lenore Jacobson, a grade-school principal,

Reprinted by permission of authors and publisher from *Psychological Reports*, 1966, 19, 115-116.

⁹The Reading at the end of this chapter is a report of Rosenthal and Jacobson's work on teacher expectancy effects in the classroom.

This research was supported by Research Grants GS-177 and GS-714 from Division of Social Sciences of the National Science Foundation. We thank Dr. Paul Nielsen, Superintendent, South San Francisco Unified School District, for making this study possible; Dr. David Marlowe for his valuable advice; and Mae Evans, Nancy Johnson, John Laszlo, Susan Novick, and George Smiltens for their assistance. A more extended treatment of this material has been published by Holt, Rinehart and Winston as a book entitled *Pygmalion in the Classroom: Teacher expectation and pupils' intellectual development* (1968).

teamed up in an effort to discover whether lower-class children do poorly in school because they cannot do better or because the teacher expects them to do poorly. The results of their investigation are presented in this article. The expectancy effect they describe has been found in the psychology laboratory as well as in the classroom; it is frequently referred to by psychologists as the "Rosenthal effect."

Experiments have shown that in behavioral research employing human or animal Ss [subjects] E's [the experimenter's] expectancy can be a significant determinant of S's response (Rosenthal, 1964, 1966). In studies employing animals, for example, Es led to believe that their rat Ss had been bred for superior learning ability obtained performance superior to that obtained by Es led to believe their rats had been bred for inferior learning ability (Rosenthal & Fode, 1963; Rosenthal & Lawson, 1964). The present study was designed to extend the generality of this finding from Es to teachers and from animal Ss to school children.

Flanagan (1960) has developed a nonverbal intelligence test (*Tests of General Ability* or TOGA) which is not explicitly dependent on such school-learned skills as reading, writing, and arithmetic. The test is composed of two types of items, "verbal" and "reasoning." The "verbal" items measure the child's level of information, vocabulary, and concepts. The "reasoning" items measure the child's concept formation ability by employing abstract line drawings. Flanagan's purpose in developing the TOGA was "to provide a relatively fair measure of intelligence for all individuals, even those who have had atypical opportunities to learn" (1960, p. 6).

Flanagan's test was administered to all children in an elementary school, disguised as a test designed to predict academic "bloom" or intellectual gain. Within each of the six grades in the school were three classrooms, one each of children performing at above average, average, and below average levels of scholastic achievement. In each of the 18 classes an average of 20% of the children were assigned to the experimental condition. The names of these children were given to each teacher who was told that their scores on the "test for intellectual blooming" indicated that they would show unusual intellectual gains during the academic year. Actually, the children had been assigned to the experimental condition by means of a table of random numbers. The experimental treatment for these children, then, consisted of nothing more than being identified to their teachers as children who would show unusual intellectual gains.

Eight months after the experimental conditions were instituted all children were retested with the same IQ test and a change score was computed for each child. Table 1 shows the mean gain in IQ points among experimental and control Ss in each of the six grades.¹ For the school as a whole those children from whom the teachers had been led to expect greater intellectual gain showed a significantly greater gain in IQ score than did the control children. Inspection of Table 1 shows that the effects of teachers' expectancies were not uniform across the six grade levels. The lower the grade level, the greater was the effect. It was in the

¹There were no differences in the effects of teachers' expectancies as a function of Ss' initial level of educational achievement; therefore, the three classrooms at each grade level were combined for Table 1. In one of the three classrooms at the fifth grade level, a portion of the IQ test was inadvertently not re-administered so that data of Table 1 are based on 17 instead of 18 classrooms.

TABLE 1: MEAN GAINS IN IQ

Grade	Controls		Experimentals		Diff.
	M	σ	M	σ	
1	12.0	16.6	27.4	12.5	15.4
2	7.0	10.0	16.5	18.6	9.5
3	5.0	11.9	5.0	9.3	0.0
4	2.2	13.4	5.6	11.0	3.4
5	17.5	13.1	17.4	17.8	-0.1
6	10.7	10.0	10.0	6.5	-0.7
Weighted M	8.4*	13.5	12.2**	15.0	3.8

*Mean number of children per grade = 42.5

**Mean number of children per grade = 10.8.

TABLE 2: PERCENTAGES OF EXPERIMENTAL AND CONTROL Ss GAINING 10, 20, or 30 IQ POINTS (First and second grade children)

IQ Gain	Control	Experimental	χ^2
	Ss*	Ss**	
10 points	49	79	4.75
20 points	19	47	5.59
30 points	5	21	3.47

*Total number of children = 95.

**Total number of children = 19.

first and second grades that the effects were most dramatic. The largest gain among the three first grade classrooms occurred for experimental Ss who gained 24.8 IQ points *in excess* of the gain (+16.2) shown by the controls. The largest gain among the three second grade classrooms was obtained by experimental Ss who gained 18.2 IQ points in excess of the gain (+4.3) shown by the controls.

An additionally useful way of showing the effects of teachers' expectancies on their pupils' gains in IQ is to show the percentage of experimental and control Ss achieving various magnitudes of gains. Table 2 shows such percentages for the first and second grades only. Half again as many experimental as control Ss gained at least 10 IQ points; more than twice as many gained at least 20 IQ points; and more than four times as many gained at least 30 points.

An important question was whether the gains of the experimental Ss were made at the expense of the control Ss. Tables 1 and 2 show that control Ss made substantial gains in IQ though they were smaller than the gains made by experimental Ss. Better evidence for the proposition that gains by experimental Ss were not made at the expense of control Ss comes from the positive correlation between gains made by experimental and control Ss. Over the 17 classrooms in which the comparison was possible, those in which experimental Ss made greater gains tended also to be the ones where control Ss made greater gains.

Retesting of the children's IQ had been done in classroom groups by the children's own teacher.² The question arose, therefore, whether the greater gain

in IQ of the experimental children might have been due to the teacher's differential behavior toward them during the retesting. To help answer this question three of the classes were retested by a school administrator not attached to the particular school. She did not know which children were in the experimental condition. Results based on her retesting of the children were not significantly different from the results based on the children's own teachers' retesting. In fact, there was a tendency for the results of her retesting to yield even larger effects of teachers' expectancies. It appears unlikely, then, that the greater IQ gains made by children from whom greater gains were expected could be attributed to the effect of the behavior of the teacher while she served as an examiner.

There are a number of possible explanations of the findings that teachers' expectancy effects operated primarily at the lower grade levels, including: (a) Younger children have less well-established reputations so that the creation of expectations about their performance would be more credible. (b) Younger children may be more susceptible to the unintended social influence exerted by the expectation of their teacher. (c) Younger children may be more recent arrivals in the school's neighborhood and may differ from the older children in characteristics other than age. (d) Teachers of lower grades may differ from teachers of higher grades on a variety of dimensions which are correlated with the effectiveness of the unintentional communication of expectancies.

The most important question which remains is that which asks how a teacher's expectation becomes translated into behavior in such a way as to elicit the expected pupil behavior. Prior research on the unintentional communication of expectancies in experimentally more carefully controlled interactions suggests that this question will not be easily answered (Rosenthal, 1966).

But, regardless of the mechanism involved, there are important substantive and methodological implications of these findings which will be discussed in detail elsewhere. For now, one example, in question form, will do: How much of the improvement in intellectual performance attributed to the contemporary educational programs is due to the content and methods of the programs and how much is due to the favorable expectancies of the teachers and administrators involved? Experimental designs to answer such questions are available (Rosenthal, 1966) and in view of the psychological, social and economic importance of these programs the use of such designs seems strongly indicated.

S.C.E.R.T., West Bengal

Date 17.3.72

Acc. No. 2338

*Scoring of the tests was done by the investigators, not by the teachers.

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MOR



WHAT GOES ON IN SCHOOLS?

What goes on in the schools of any nation—elementary, high school, and college—reflects in some way the beliefs and values of the people of that nation. What goes on—the curriculum—is all the experiences of children, in and out of school, for which the school is responsible. The culture sets the task, provides the content, and conditions the results of education. The dominant values of the culture give direction and impetus to the methods and the goals of our schools.

Thus if you were to look in on our thousands of elementary and high-school classrooms, you would see activities reflecting the values of our culture and the goals of education in our nation. And you would see further that within this cultural context, the nature and needs of the learners provide the ultimate basis for the selection of content, its assignment to grade levels, its organization for teaching purposes, and the choice of methods felt to be most fruitful for achieving the desired behavior changes.

VISITS TO FOUR SCHOOLS

This chapter will give you an opportunity to look into the activities of four schools. Throughout the country you could find school programs approximating these four situations, although you probably would find totally dissimilar programs as well.

These text “tours” are not intended to supplant visits that you may make to existing schools in your community. The more schools and the more classrooms you can actually visit, the better prepared you will be for this course and for your advent into teaching.¹

You will soon find that each institution is unique and that the differences you see reflect the diversity of beliefs and values held by those responsible for organizing and guiding the learning experiences there. You will be aware, too, of the relation of home and community backgrounds and values to the school program. To give depth to your observation, keep the following nine factors in mind as you visit each school.

¹Those who are interested in further reading along these lines will enjoy reading about the adventures and misadventures of two first-year teachers as portrayed in Appendix A of *Psychological Consultation in the Schools*, by Ruth G. Newman (New York: Basic Books, 1967).

1. *The learners* Watching the youngsters, do you see the kinds of behavior you would expect from students of their age group? You will want to notice the learner's attitudes toward school and toward the learning activities in which they take part. Would you say that they are passive recipients or active participants?
2. *The learning activities* What activities are the students engaged in and what are they trying to learn? Do these activities seem important to you? Do they seem important to the students? Do they have application outside the classroom? Who plans them? How do the learners respond to their learning activities? What do you think they are actually learning? What similarities and what differences do you note in comparing the activities in the various school situations?
3. *The learning process* Look for various methods of instruction such as drill, lectures, question-answer, problem-solving, project, discussion, and others. What is the program built upon—the students' interests, textbooks, a course of study prescribed by the state? Is there sequence in the learning process? Do you see any relation between the teacher's goals and the methods used? What measures are taken to make it likely that the learning will be retained and put to use in everyday living?
4. *Readiness for learning* Do all the students seem to have the same capacity for learning? What differences in ability are apparent? How does the school provide for such differences? Do you see any ways in which the students' socio-economic level seems to influence what goes on in school?
5. *Motivation for learning* Look for purpose or lack of purpose in students' approach to learning. Why do you think the students do what they do? What devices does the teacher use to get them to learn? Look for devices such as expectation, rewards, whetting curiosity.
6. *The group interaction* Are the members of a class working together or do they tend to work individually? What role does the teacher play? To characterize the "personality" of a class, which of these adjectives would you choose: competitive, cooperative, quarrelsome, friendly, hostile, apathetic, tense? What do you think makes the emotional climate the way it is?
7. *Learning and discipline* You will want to notice what is considered to be "good" discipline. Who assumes responsibility for individual and group discipline—the teacher, the students, or both? What devices do you see used to channel and control group behavior?
8. *Individual problems in the classroom* What, if anything, do teachers do about individuals who do not seem to fit well into the class group or the regular learning program? Do various teachers seem to have the same conception of their responsibilities with regard to such students?
9. *Evaluation of learning* Who determines whether or not goals have been met and whether or not students are progressing—the students, the teacher, or

both? You will want to look for types of evaluative procedure other than tests and marks. Some of these are discussion, check lists, student-teacher conferences, self-evaluation, and group evaluation.

As you "visit" the following schools you will find that these nine factors are closely interwoven parts of the total learning situation. Our purpose in taking you on these visits is not to point to the examples as desirable or undesirable but to give you an idea of the range and variety in what goes on in schools. In later chapters, as you build on the observations you make here and elsewhere, you will reach your own decisions as to what's "good" or "bad."

For observation

MISS ROGERS' SCHOOL

You arrive at Miss Rogers' school late one September morning after school has begun. This school is in a new subdivision in what is regarded as one of the more desirable suburban areas. The building itself is new and the architecture attractive. As you walk through the spacious entryway and down the corridors you get brief glimpses of large, well-lighted, attractive classrooms. The principal, with whom you have already made arrangements for your visit, welcomes you and suggests that although sometime during your visit you will certainly want to tour the whole building, you will probably get the most from your visit if you spend the major portion of it in one of the classrooms.

You choose to go to a primary class and the principal suggests that Miss Jane Rogers' first grade might be a good place to see a primary program in action.

On the way to the classroom the principal tells you a little about the school. The pupils, she says, come almost entirely from the middle-class families who have moved to the suburban community to escape the increasing congestion and unfavorable housing conditions of the city. There are almost no children in the school from the lower socioeconomic groups.

The parents in the area are neither rich nor poor but, as the principal remarks with a smile, they are mostly young and uniformly ambitious. They are on their way up and they want their children to have the very best education they can get. A few parents are quite demanding and sometimes critical of the school's program, but most are cooperative. The parent organization in the school is strong and active and includes a large proportion of fathers. The principal also points out that the primary concern of the school is a strong academic program, particularly in the fundamental skills, but the curriculum also stresses music and the arts.

When you open the door to the classroom you see Miss Rogers sitting with a group of children in a circle. She comes over and introduces herself, expressing pleasure at your visit. She turns and introduces you to the children, who have been looking on curiously. You find a seat at one side of the classroom, and she returns to her place in the circle. Along a side wall are three low bookcases holding bright-colored books. Grouped around a reading table are several chairs and two wicker rockers. One corner has two easels. Another corner is open except for colorful rag rugs scattered around the floor. A large aquarium containing goldfish shares reading-table space with picture books. Two children on their way to the library corner stop a moment to watch the fish.

An outline of the day's activities is written on the blackboard. It is headed "Our Plans for Today" and reads:

We will sing and salute the flag.
We will have sharing time.
We will listen to poems.
We will work on our "Pet Book."
We will have recess.
We will read a story and work on our pictures.
We will have lunch.
We will talk about what we have done.
We will talk about what we are going to do.
We will have rhythms.
We will read and work on pictures.
We will have story time.
We will clean up the room.

There are ten children in a reading circle. The others are working at their seats, cutting out pictures from old magazines and pasting them into a large book entitled "Our Pets at Home." Apparently they know just what they are doing, for they work quietly without interrupting Miss Rogers and the reading group. They discuss among themselves which pictures to choose and how to place them in the book.

You turn your attention to the reading circle as Miss Rogers begins to discuss with these children a Mother Goose rhyme she read to the class earlier that morning. She holds up a large piece of cardboard on which a poem is printed beneath a picture of a windmill. The children say the verse together a few times, enjoying the rhythm.

"Have any of you ever seen a windmill?" Miss Rogers asks. One little boy remembers that he once saw one in the country, but he doesn't think it looked like the one in the picture. "This is the kind of windmill we would find in other lands where the wind is used to turn a mill to grind the grain into flour. In this country we have big factories to grind the grain and don't have to depend on the wind for it," Miss Rogers explains.

"The windmill in this picture is the kind our toy windmill was made to look like," Miss Rogers says, going to the bookcase and bringing the toy windmill back for the children to look at more closely. "Toys are often made to look like real things we see or things in other countries we may not have a chance to see."

Miss Rogers asks the children to think of the toys they have that represent real-life objects, or people, or animals. Several of the youngsters name a number of different toys.

Next Miss Rogers shows the group a picture of a toy store window and suggests that each child tell about some time that he has been given money to buy a toy and how he went about it. You notice that the children's talk has more of a conversational than a recitation tone. How casual Miss Rogers is, you think, until you realize that she is careful to draw each child into the discussion and, with comments and questions, to aid him in telling his story.

Miss Rogers turns to a large paperbound book and holds it open so that all the

children can see it clearly. There are four colored pictures on the page, illustrating the story of a little boy and a little girl who go to a toy store to buy a toy.

Miss Rogers lets the children talk freely about the first picture, guiding them to observe that the children in the picture are dressed to go out, that the little girl is carrying a purse, and that it must be a warm day because neither child is wearing a coat.

"Why do you think the children look so pleased?" she asks. The answers she gets are reasons the reading circle members would have had themselves.

Miss Rogers and the children spend some time discussing what happens between the first and second pictures. Leading them into the second picture, she asks what the children will buy—what toy might please the little girl and what will probably please the boy. The youngsters note with delight that a toy windmill is prominently displayed on one of the shelves, and several of them think that the little boy would be very happy to have the windmill.

Before going on to the third picture, Miss Rogers again helps the group to visualize the missing action. She listens to their suggestions of what the boy in the picture might be saying as he talks to the clerk.

"What do you suppose is in the package?" Miss Rogers asks as they go on to the fourth picture. The children seem to be intrigued with this bit of mystery. By comparing the third and fourth pictures, they conclude that the windmill is missing in the fourth one and must have been the final choice. Miss Rogers encourages them to describe the action of the two little shoppers paying the salesman and receiving their change. When she asks what the picture children will do with their new toy, she gets a variety of responses.

Miss Rogers lets the children study the entire sequence for a while and then calls on individual children to stand beside her and retell the whole story. You observe how the interest increases as extra details are filled in—each child wants to add his bit.

"This is a good story," one boy comments.

"I like this story too, and tomorrow we will find out what happened to the toy windmill," Miss Rogers says. "But now it's time for us to go to lunch."

You return early from lunch to find a variety of things going on. One boy is painting at the easel. Two girls are talking with Miss Rogers. One of them wears a hearing aid, you notice, and Miss Rogers is enunciating with particular clarity. Several children are playing in the toy corner.

Two children are lying on rugs. One boy explains matter-of-factly, "That's just what my sister does at home. When she's tired, she just goes off and lies down."

Just then the bell rings, and the children gather around Miss Rogers in the front of the room. Some bring their reading chairs, others sit cross-legged on rugs or newspapers spread on the floor. Miss Rogers asks the group that has been working on the pet book to tell the rest of the class what they have been doing. When they finish, she compliments them on their work.

"Now that the books are almost finished," Miss Rogers says, "what do you think you would like to do next?" Ideas come rapidly and the children grow very excited. Voices become shrill as they compete for attention. Group unity disintegrates rapidly.

Miss Rogers interrupts quietly. "Now that we have all these ideas, maybe we can figure out how to do something about them."

Gradually the children stop their shouting and, one by one, they turn to listen to her.

"While I write your ideas on the board, can anyone tell me what we can do with these ideas?" Miss Rogers asks.

After talking over the suggestions, the children decide they will make a toy store. Miss Rogers says they will discuss plans for the store the next day and sends the children to their seats.

A short rhythm period follows. Children jump like jumping jacks, bounce like balls, walk like mechanical toys. One child spins like a top. Another imitates an airplane.

Miss Rogers spends a few minutes seeing that each child has something specific to do before she asks a group of fourteen children to come to the reading circle. You find it interesting to compare this session with the one you observed this morning. These children seem to be more advanced in their use of language, and they are on a page farther along in the same book.

When these children have returned to their seats, Miss Rogers turns her attention to the group that has not yet had a reading period. She asks one of the boys to pass out workbooks to them. She directs them to turn to a page on which there are several pictures of animals and explains carefully what they are to do. They work busily at their seats as she walks about giving help and answering questions. As each child finishes, she checks his work, and when the last one is done she speaks to the entire class.

"What shall we plan for tomorrow?"

Several of the children speak together, "Let's start with a song."

"Good," says Miss Rogers. She erases the outline for the day and writes at the top, "We will start with a song."

The group makes many other suggestions, and the teacher writes them on the board. One boy wants to have two painting periods, but when Miss Rogers asks the group if they think it is a good idea they say no, because that would mean giving up something else and there is no hurry to finish the paintings.

When the outline for the next day is complete, some of the children shift to more comfortable positions and Miss Rogers takes out her storybook. As she asks someone to remind the class briefly of what went on in the story the day before, you slip out of the classroom.

Your next visit will take you to a fifth-grade classroom. As you read, you will no doubt find yourself contrasting this classroom with Miss Rogers' class and noting differences. Try to determine which of these differences stem from the age level of the children and which from the teacher's approach to the elements listed on page 23.

For observation

MISS BLAKE'S SCHOOL

The school in this visit is situated in a section of the city that once was regarded as "very exclusive," meaning that it originally was inhabited by people of very

substantial means, many of whom were of the "first families" of the town. As you walk toward the school you see that the lots are large, the houses much bigger than those of the subdivision of your last visit. You sense an air of stability and permanence in the neighborhood.

Yet there are signs that the city is creeping in on this section. Along the edges of the neighborhood some of the houses have already been divided into apartments and rooming houses. Some of these houses show the need of paint and repair. What once were broad lawns apparently have become playgrounds for children living in the apartments. The grass is trampled into bare spots and pieces of play equipment are scattered about.

When you arrive at the school building a few minutes before nine o'clock you see that it, like the houses in the neighborhood, is of another era of architecture. It is substantial, dignified, and a little overpowering with its massive front entrance. The grounds around it are well kept. The play area is in the rear of the building and it looks all but certain that no child has ever set foot on the front lawn.

The children are lined up at the side doors of the building. You watch as they march into the building, keeping their quiet, even lines. The principal does not speak to you until the last child is in his room. When she turns to you she expresses pleasure in your visit and says she will tell you something about the school.

She stresses the fact that the majority of pupils come from families that are ambitious for their children. In fact, many of the pupils in the school are from some of the oldest families in town. A very high percentage of parents expect to send their children to college and, in many cases, on to professional schools—particularly schools of medicine and law—or leading graduate schools. The principal indicates that, although preparation for college is the primary responsibility of the high school, her elementary school does everything it can to give pupils an adequate background for their high-school work.

Then, as you walk toward the classroom you are to visit, the principal reinforces the impression you gained on your way to the school. "The character of this school district is changing," she says. "Along the fringes of the district another class of people is moving in and their children are now in our school." She adds quickly, "Of course, they are nice children and we are glad to have them."

But as the conversation proceeds you begin to sense that the principal is troubled and you have the feeling that part of the trouble involves the presence of these children. "We believe in learning in this school," she remarks, "and we still believe in standards too. Standards for learning and standards for conduct. But we are having more trouble with this now than we used to. I have been in this school for twenty-five years, first as a teacher and then as principal, and I know.

"We have always tried to keep our curriculum up to date. We have never gone after every new fad that comes along, but when good, solid improvements appear we try our best to adopt them. For instance, three years ago we adopted the new math and reorganized our whole arithmetic program along those lines. We were one of the three schools in the system that elected to experiment with the new trend in mathematics. We are just beginning another experimental program in the teaching of science. Some years ago we began to teach beginning reading on a strict phonetic basis and we stress reading at every grade level.

"But we are having more trouble with achievement than we used to have and

I don't believe it is because of the curriculum. The average intelligence level in our school has gone down over the past four or five years and there isn't much we can do about that . . ."

She breaks off and says apologetically, "I don't suppose I should be saying these things to you and I will ask you not to repeat them—although I'm not sure it's much of a secret any more." Then she pauses at a classroom door and says, "At any rate, here is Miss Blake's room. We think she is about the finest fifth-grade teacher in the city. Her classes have always had one of the highest achievement rates in the system. We are glad to have you visit our school and we hope you will enjoy it."

When you enter the room Miss Blake shows you to a chair at the back of the room and gives you a copy of her daily program.

DAILY PROGRAM

Grade Five

Miss Ruth Blake, Teacher

9:00 Opening Exercises

9:15 Mathematics

10:00 Reading

10:45 Recess

11:00 Social Studies

12:00 Lunch Hour

1:00 Science

1:40 Handwriting

2:00 Language and Grammar

2:45 Recess

3:00 Hygiene (Monday, Tuesday, Thursday)

Music (Wednesday)

Art (Friday)

3:30 Dismissal

The thirty-two pupils in the class for the most part appear well nourished, neat, and clean. Four boys seem somewhat older than the others and stand out because of their size. The movable desks are arranged in five straight rows facing the front of the room. The walls are painted a cream color. There are a set of wall maps, a globe, sets of books on shelves, and several closed cupboards. At the front of the room portraits of George Washington and Abraham Lincoln hang far above the children's eye level. A vase of flowers stands on one corner of Miss Blake's desk.

Precisely at nine o'clock a bell rings. At a word from the teacher the class stands and repeats the Pledge of Allegiance to the flag. The children remain standing while they sing "America." Miss Blake reads a poem and comments briefly on its meaning. This concludes the opening exercises.

After the opening exercises Miss Blake asks the class to get out their homework papers in mathematics. She goes around the class asking one child, then another the answer to various problems. In three cases she asks a child to go to

the chalkboard and show how he worked the problem. One boy is unable to do so, although he reported the correct result. Miss Blake looks displeased and tells the boy she would like to see him at recess time.

From where you sit you can see that one of the larger boys has almost nothing written on his homework paper. During the recitation you see him covertly trying to copy something onto the all but blank sheet.

Finally Miss Blake's eye catches his concealed effort to get something written down. "George," she says in a voice heavy with patience, "you know I tolerate no cheating in my class. Your homework is supposed to be done at home." Then she goes to the chalkboard where a list reads:

Ralph Owens	3:30-4:00 Monday through Friday
	Mathematics
Henry Keen	3:30-4:00 Monday, Tuesday, Wednesday
	Spelling
Mary Wallace	3:30-4:00 Monday and Tuesday
	Writing

Miss Blake adds the name of George Davis, 3:30-4:15, Monday through Thursday for mathematics. George looks unhappy but says nothing as his name is written on the board. Miss Blake finds it necessary to reprimand two girls for giggling. If she has to mention it once more, she says, she will add their names to the list for conduct.

Next, Miss Blake directs the class to do fifteen problems on page 125 of their mathematics book. It is evident that she is not well pleased with the homework of many in the class.

For the next thirty minutes everyone is working on the assigned problems. The room is very quiet. You begin to get uncomfortable as you sit in silence for fear some movement from you will be disturbing. Your leg falls asleep. Miss Blake either sits at her desk, keeping an eye on the class, or walks up and down the aisles to see that everyone is working. She pauses to give help when a child asks for it and stops to tell you that she is sorry she can't talk to you now because the children need so much supervision.

At 9:55 the children hand in their arithmetic problems and are told to take their readers from their desks and turn to page 187. Each child is asked to read a passage aloud in turn, and the others are reminded to keep the place. Some read fluently, others stumble through their passages. Miss Blake frequently stops a child in the middle of a paragraph and asks the next reader to go on. In this way she finds several who are not keeping the place. She says nothing, but looks displeased.

When the story is finished, Miss Blake calls the youngsters' attention to the questions at the end and asks volunteers to read and answer them. As one girl starts to answer the first question, a commotion breaks out in George's corner of the room. Miss Blake moves quickly to the place of the disturbance, grasps George firmly by the arm, and marches him out of the room. The room becomes hushed. One child directly in front of you whispers nervously to his neighbor, "That's the second time this week he's gone to the principal. Boy, do I feel sorry for him!"

Miss Blake returns to the room alone. As she concludes the reading lesson, members of the class raise their hands hesitantly to volunteer answers to remaining questions. At 10:45 on the dot Miss Blake ends the lesson.

Then, at the direction, "Class, stand!" all the children stand in the aisles. Two boys, apparently monitors, go to the windows and open them wide.

"Row one, pass," Miss Blake says. "Row two, row three," and so on, until the entire class has left the room. She explains that she has playground duty, so you follow along to observe the group at play. The class scatters to join children from other rooms in various games or to lean against the building and watch the activities. The boy who could not work the problem at the board amuses himself by snapping a rubber band at the smaller boys whenever the teachers are not looking in his direction.

The class returns from recess in the same orderly fashion. The monitors close the windows while the boys and girls take their seats for the history lesson. It is obvious that Miss Blake has assigned this lesson in history the day before. Upon reaching their seats all the children open their books to the beginning of Chapter XII and read to the bottom of page 168. As each child finishes, he takes a tablet from his desk and writes the answers to the five questions that are on the side chalkboard. Those who finish the questions before the end of the period are told to go through the chapter again to find each of the words listed on the board, copy the sentence in which it occurs, and write sentences of their own using the word.

A few minutes before the noon bell rings, Miss Blake reminds the class that a test covering the entire unit will be given on Friday and that those who fail it will remain after school for make-up work.

"Remember," she says, "report cards are coming out in two weeks."

After the children have filed out of the room you approach Miss Blake with the hope of asking her some questions. She tells you that she can only stay a minute because she has lunch duty in the cafeteria and it is important for her to be there on time. She adds, "I'm sorry that unpleasant incident had to happen when we had a visitor in our room. But if you are going to be a teacher, you ought to learn right now to nip the trouble in the bud and not let it get out of hand. George causes quite a lot of trouble and I simply will not stand for it—it's not fair to those who want to learn."

You hazard the observation that a few of the boys, including George, seem large for the fifth grade. Miss Blake replies that all of them have been retained twice during their elementary-school years. "And," she continues, "none of them is up to grade standard yet. Probably they ought to be retained again—how are they ever going to do sixth-grade work?" Then she adds, "But they're getting too big and too hard to handle. They'll have to go on and take their chances—or perhaps go to a special class."

Then, with a curt goodbye, Miss Blake is off to supervise the lunchroom.

Your next visit is to be to a high school and your interest quickens because memories of your own high-school days are more vivid than those of elementary school. Will this high school be like the one you attended only a few years ago—or have changes occurred that will make it different?

For observation

MR. JOHNSON'S SCHOOL

The building, you find, is located on the edge of the city. All around it new houses are springing up. The building itself is new, sprawling, and vast. It is situated on a very large tract of land, part of it still in the early stages of landscaping, the rest devoted to play fields, tennis courts, and a football stadium.

It is not quite time for school to begin and students are still arriving, some in school busses, some on bicycles and motorcycles, still others in jalopies, middle-aged sedans with rusted fenders, and a few in sleek little foreign-made sports cars. You note with some astonishment that the parking lot, though very large, is almost full.

You follow the crowd of students through an entrance and into a maze of brightly lit corridors. You wander around a little, dazed by the crowd and the bustle of students on their way to class. Finally you ask for directions and a girl points the way to the main office. There you introduce yourself to the secretary who in turn presents you to the assistant principal, Mr. Johnson. Mr. Johnson's greeting is cordial and he obviously has given some thought to how you might spend your half day in his school to best advantage.

"This is a fairly large high school," he says. "We enroll more than two thousand students here in grades ten through twelve. You couldn't see all there is to see here if you stayed a week. So, I suggest we do something like this. I will tell you some things about our school, then we will walk around the buildings to get an idea of the general setup. Then, whatever time is left you may want to spend in one or two classrooms."

You agree that this sounds like a good plan and Mr. Johnson begins. "This is the newest of the three high schools in our district," he tells you. "It enrolls all the students from the south and east parts of the city. We have a pretty good cross-section of the high-school-age population, but we have more students here who are going to college than the other two high schools have. Still, we have some of every kind, from the least to the most academically talented.

"Our school is a comprehensive high school. There are no special high schools in this district of the kind you will find in some other localities. Our job is to take all the students who come here and try to give each one the kind of educational program that will be suitable for him. This means we must have several different kinds of programs and it can all get pretty complicated."

You ask Mr. Johnson if he will tell you something about how this works.

"At present, we have four tracks in our program. The first track is for college-bound students. The work is academic and rigorous. The purpose is to get students ready to compete in college and our record is very good. We are successful in getting our students into good colleges and most of them do well after they get there. Naturally, we are quite selective in our admission to the college-prep track—we have to be. The biggest difficulty we have is in persuading some parents that their children don't belong in this track. The college-prep program has a lot of social prestige—though, of course, it really shouldn't have—and we have to put up with a lot of pressure from some parents. Sometimes it is very difficult . . ." A faint note of weariness seems to creep into Mr. Johnson's voice.

"The second track," he continues, "is for those students with moderately good aptitude who are interested in training for business and commercial work. Some of these will get the skills they need right here—stenography, office machines, business mathematics, bookkeeping, and things like that. They will be ready to apply for jobs in the business world when they graduate. Many of them get quite good jobs. Others in this program will plan to go to junior college or some other kind of institution for additional training. More of them are doing this these days, I suppose because the new developments in office work require more training than we can give.

"The third track is devoted to industrial and trade training. This is a vocational program and a considerable part of the cost of it comes from funds allotted by the federal government. We also have some general shop courses that students in other tracks can take as electives, but these courses are different from the work in the vocational-industrial program which is designed to train students for specific jobs in industry and the skilled trades. In these vocational programs students must spend a minimum of fifteen hours a week in the shop during their junior and senior years. They must also take at least one subject that is related to the trade they are learning—mechanical drawing, for example, or applied mathematics. Many, of course, take both. We train students in our program here in the building trades, electronics, auto mechanics, and tool-and-die making. There are other programs we could have but we try to gear our vocational training to specific opportunities in the community and these trades seem to be most in demand.

"The fourth track is one we usually call the 'general program.' Frankly, this track is designed for those with the least aptitude for learning. Of course, the people in this program cannot possibly do anything in the college-prep program nor in the commercial track. I guess you would say they just don't have the brains. But they don't fit into the vocational-industrial program either. They don't have the kind of aptitudes that skilled work requires and most of them don't even seem to have any interest in preparing for that kind of job anyway. In many ways this is really a remedial program. We are still trying to teach many of these students to read and do the rudiments of arithmetic. We can't teach them much history or geography or anything like that, but we do try to teach them civics and simple knowledge about government. After all, they will soon be voters.

"You probably can guess that many of our dropouts come from this group. They don't seem to like school—most of them—and a lot of our discipline problems arise in this group—but not all of them, by any means! Most of our teachers resist being assigned to teach sections of this group, but there are a few who like to work with these boys and girls. I guess they have some kind of missionary spirit—they like to help people, or something. I wish we had more teachers like that. . . ."

Mr. Johnson sits in silence for a moment, then he observes, "We really shouldn't sit in this office all morning. You came to see what goes on in our school, but I thought it would be helpful if I told you about how our program is organized. There are a couple of other things I want to tell you about, but we can do that while we walk around the building."

The two of you walk down a corridor toward a wing of the building that contains conventional classrooms—the kind you remember from your high-school days and the kind you sit in every day in your college classes.

"One thing I ought to tell you," Mr. Johnson says, "is that although we have four tracks in our curriculum, we also have a common core of studies that everyone must take in order to graduate. Everybody must take four years of English, three years of social studies, at least one year of mathematics, and one year of natural science. We believe there is a common core of essential material that every student must have in high school—regardless of what program he is enrolled in or what his future plans may be. Of course, these subjects have to be taught in different ways and at different levels to students in the different curriculum tracks. Four years of English in the college-prep program are different from four years of English in the general track, you may be sure! And, of course, the same thing is true for the other required subjects. Students have to be grouped by ability if teaching is to be at all effective. But we believe everyone should be exposed to these subjects, regardless of whatever else he takes. You might say this is a basic part of our philosophy of education.

"The other thing I want to tell you is that we are not fully satisfied with the track system of organization and we are planning a transition to a more personalized kind of scheduling. Eventually, we hope to be able to design a program for each student—one that will fit his aptitudes and ambitions. If we can do this, we will be able to get away from labeling students as being in this track or that—something many of us don't like very well. This will require a much more extensive counseling program than we now have. This costs money, but we think it will be worth it. Of course, we will still do a great deal of grouping by ability, but the new plan will make it possible to regroup for every subject. As you know, most of us are better in some things than in others, but the track system cannot provide for this kind of individual difference. In a few years we hope to have made significant improvements."

Mr. Johnson pauses before a door of a classroom. "Here is a college-prep class in senior English," he says. There are still about twenty-five minutes left of the period. Would you like to go in and observe for the rest of the hour? I'll come for you at the end of the period." You open the door and slip as unobtrusively as possible to a chair at the back of the room. The teacher nods and smiles at you, and goes on with what he is doing.

As you look around you see a class of approximately thirty-five students. They are clean, neat, well groomed and, of course, dressed according to the prevailing adolescent styles. At first glance, they seem attentive. There is no disturbance among them and they are all watching the teacher as he writes something on the board. Most of them are making notes of what he is writing.

At first you find it hard to catch the drift of the discussion, but you soon gather that the class is engaged in a study of Edmund Burke's speech on "Conciliation with the Colonies." The teacher has been writing a summary of the arguments presented in the speech.

The teacher turns from the board and speaks to the class. "Burke's speech on conciliation is a great example of English rhetoric. We have been talking about the arguments he develops in this address and we now have made a summary of these. But, of course, this speech is famous not only for its content and logical structure, but also for its language. The next thing we will do is to note certain passages in the speech and study them from the standpoint of Burke's style.

"For example, what does Burke allude to when he speaks on page 49 of

supporting 'the temple of British concord'? Perhaps you had better read the whole passage to yourselves." The students take their books and look for page 49. Three boys have forgotten to bring their texts and the teacher, with a mild look of disapproval, tells them they will have to look on with someone else. One boy asks where on page 49 the passage is to be found. A girl volunteers that it begins on line 26. "Will you read the sentence, please, Karen?" the teacher says.

Karen reads, "I think these six massive pillars will be of strength sufficient to support the temple of British concord."

"Very well," says the teacher, "can you tell us, Karen, what is meant by the 'six massive pillars'?"

Karen flushes and bites her lip. She looks around anxiously. "No, sir," she says softly, "I'm afraid I can't."

The teacher looks around the class. There are no volunteers in evidence. "Does anybody know?" he asks. There is no answer. The teacher looks around at the chalkboard. "What do we have here?" he says pointing.

"Burke's propositions," says a boy, glancing at his notes.

"How many of them are there?" the teacher asks.

"Six," several students answer together.

"Do you see any possible connection?" the teacher asks. A faint acidity creeps into his tone.

"Oh!" exclaims a voice from the back of the room, "I know!"

"Yes, Jack, what is it?"

"The six pillars," says Jack, "are the six propositions Burke presented in his speech."

"Very well," says the teacher, "now what is meant by 'the temple of concord' these pillars are sufficient to support?"

A vast silence ensues, broken only by the occasional shuffling of feet. Two boys glance covertly at the clock. The teacher sits at his desk looking around. He taps the top of his desk with a pencil. Finally he says, "Our time is about gone, so I will interpret this one for you. The allusion is to the Temple of Concord in Rome. The Roman Senate used to meet there during the time of Catiline's conspiracy. I assume you know who Catiline was. Well, this is an example of some of the ways in which Burke gave depth and richness to his prose. Now, I have prepared a list of ten other examples for you to analyze. I want everyone to work on these tonight and write his interpretation of them. We will discuss them in class tomorrow." He begins passing out copies of the assignment. "Are there any questions?" he asks, looking around the class.

A boy raises his hand. "Will these be on the exam?" he asks.

"Of course," says the teacher. "These are very important and anyone who hopes to do well on the examination next Friday will have to know them."

A bell rings in the corridor. The students quickly gather up their books and papers and file out the door. You would like to say a word to the teacher but you see Mr. Johnson is waiting for you in the corridor so you simply shake hands with the teacher and thank him for his courtesy.

Mr. Johnson asks whether you would like to see a little of what goes on in the industrial program of the school and when you indicate that you would he leads the way to another part of the school. You go along the corridor past various shops and a drafting room where students are bent over drawing boards, and finally

enter the large auto shop. There are work benches along the walls, several automobile engines are mounted on blocks in the center of the room, and at one end of the shop three boys are working on an automobile. Another student is intent on his work at a lathe.

The teacher, wearing a shop coat, comes up and Mr. Johnson introduces you to him. "See that kid working under the hood," the teacher says, pointing to the car the students are working on.

"I think I know him," Mr. Johnson says, "but I can't remember his name." The boy is thin and stringy. He is chewing on a large wad of gum and his jaws move rhythmically as he works. He straightens up, wipes his hands on a rag, and peers into the automobile engine. He chews faster as he surveys what he has done.

"Well, his name is Bob Erickson and he is the best mechanic I ever had in this shop. That kid has talent—real talent," the teacher says.

"Oh, yes," Mr. Johnson says, "I remember him. He had some trouble with civics—and English, too, as I recall."

"Maybe," says the teacher, "but what I wanted to tell you is that he has got it in his head to go with some racing outfit and work in the pit as a mechanic."

"Oh?" says Mr. Johnson.

"Yes," replies the teacher, "and it will be a shame if he does. He's got talent, but he doesn't know enough yet. He's not that good. If he leaves school now he'll be just another grease monkey bumming around the country following the cheap racing outfits."

"Has he been to guidance?" Mr. Johnson asks.

"Oh, yes, he's been to guidance," the teacher says, "but . . ." Then he adds, "I'm going to get Fred down at Lanscomb's Agency to talk to him. Fred's the shop foreman down there. He knows Bob. He knows he's got talent. Maybe he can tell him."

As you listen to the conversation Bob comes over to the boy working at the lathe. He comes up to the boy at the machine. "Ain'tcha got that goddam thing done yet?" His voice carries loud and clear to where the three of you are standing. The other boy shuts off the motor and gives a quick backward jerk of his head in your general direction. Suddenly, it is very quiet in the shop.

Mr. Johnson clears his throat loudly and elaborately. The teacher is staring at the floor and moving a small piece of scrap metal around with the toe of his shoe. Bob looks up quickly and when he sees the three of you his jaws stop working on the gum. He looks around, wiping his hands vigorously. He says nothing, turns and goes back to the car and peers down inside the engine.

"Well!" says Mr. Johnson.

"Yes, I know," the teacher says. "I'll take care of it. He knows he's not supposed to talk like that around school."

"We have a rule against profanity," Mr. Johnson says pointedly.

"Of course, but I'll take care of it," the teacher says. "I can handle him."

Mr. Johnson says no more and turns to leave. The teacher is staring back at him. When you are in the hall outside the shop Mr. Johnson says apologetically, "In a comprehensive high school you get all kinds."

"Yes, of course," you reply.

A bell rings. "That's the bell for the first lunch shift," Mr. Johnson says.

You look at your watch and see it will soon be time to go. You ask Mr. Johnson whether there is a chance you might see something in the fourth or general-track group. He replies that students in this track are in the first lunch shift and will not be back in class for nearly forty minutes. Since your schedule does not allow you to wait this long, Mr. Johnson suggests that you might talk with one of the teachers who works with students in this track.

As you walk along Mr. Johnson tells you, "Mr. Edwards, the man I think you should talk with, is really an unusual person in many ways. He is the kind of teacher who likes to work with the students we have in the fourth track. Some of our faculty think he is too lenient and indulgent with the students—and I think perhaps sometimes he may be, but I confess I don't know what we would do without him."

The two of you enter a classroom where a teacher is working at his desk and Mr. Johnson introduces you to Mr. Edwards, telling him you are interested in learning a little about teaching problems in the fourth track. Mr. Edwards' manner is cordial and relaxed and as Mr. Johnson leaves the room he asks, "Are you planning to be a teacher?" When you tell him you are, he says, "Well, then you had best learn as early as you can that it is not all giving out assignments and following the course of study and having nice little class discussions in which all the students participate eagerly."

You reply that you are sure teaching is more than that. "Yes," he says, "in a sense I knew it is more than that too when I began to teach. But I knew it as an abstraction—something we were told in class and wrote down in our notebooks. I didn't get much of a taste of reality in student teaching either because I was assigned to a high-ability group in senior English and I could teach *Macbeth* and the poetry of Keats and Shelley without much trouble. If there were discipline problems the regular teacher took care of those. I thought it was great. Nothing to it but careful preparation for class. I got an 'A' in the course. I thought I was pretty good.

"Then I came here for my first teaching job and I drew five sections of English in the fourth track. This released a couple of teachers to teach in the higher tracks and you never saw people so relieved. I once overheard one of them say that she felt ten years younger after she got out of that bunch of hoodlums.

"Well, I was prepared to be called 'Teach' and to take a certain amount of backtalk and rowdy behavior—or at least I thought I was. But I also knew that I was expected to teach the course of study and the administration is pretty tight on this, even in track four. I'll never forget those first few days and weeks. I'd never heard the Anglo-Saxon monosyllables used openly in a high-school class—I don't mean written on the walls in the toilets or on the blackboard when the teacher is out of the room. I mean *in class*. There is a rule, of course, against such language but I soon found out that it is one thing to have rules and something else to enforce them. And I also found out that sending a student to the office usually created more problems for me than it solved. There is one thing that holds these kids together—even though they will fight like demons among themselves—and that is their conviction that the school is against them and, therefore, they are against the school. I believe the fashionable term is 'alienation.'

"The fact of the matter is that the fourth track is made up of rejects. They are rejected by the school—and they know it. They are also rejected by society at

large. In a way the kids know this, too, but it's not as clear to them—as yet. Well, you know as well as I do that all that can come out of a situation like this is frustration—and a pretty high level of it at that. The most obvious expression of it is the overt aggression that goes on day after day, month after month. I suppose it started in elementary school, but it's full-blown by the time they get here. They're not all aggressive. There are some who have just stopped trying at all—completely apathetic. For me they are a worse nightmare than the others.

"I suppose I've asked myself a thousand times what it is they really are interested in. I know what it is, of course. They want cars and excitement. They want to feel like somebody, and jobs and cars and money are symbols of this. Of course, I guess all adolescents are like this, but most middle-class kids have other things going for them. They can look ahead and see something in the future. But these kids live from one day to the next without much thought for what they're going to do or be in five years or ten—or even one! A good many of them will be delinquents—some of them already are. And here I sit and wonder what can be done about it!

"I've been here three years now and I think I've done a good deal to gain their confidence—but not completely. I don't believe any teacher can do that. But they confide in me—at least a good many do—and they know I don't report everything I hear to the front office. They know I will defend them against the administration if they are in the right, or at least have a good case. I've done it many times and it hasn't increased my popularity with some of the staff. You have to be careful and a lot of it you have to play by ear. It took me exactly one week to find out the hard way that the 'buddy-buddy' approach is the way to complete disaster. You can't be their buddy and they don't want you for a buddy. Twice in that awful week I found my car with four tires flat—once in the school parking lot and once in front of my house.

"Then, naturally, I decided to get tough. I'd just as soon forget all of that. As I remember, it took them about two days to reduce me to the edge of a nervous collapse.

"The truth is—but I'm afraid it's heretical to say it—the kind of program we have for these kids is almost completely unsuited to them. It's amazing that as many stay in school as actually do. Sometimes I think if we could get a program that had dollars and cents built into it—apprenticeships and opportunities like that where the kids could do some real work and earn a little money—we could do a lot more for them. But any time I've mentioned it I got turned off right away. It's completely impractical, people say. Who's going to hire *these* kids? The labor unions certainly don't want them for apprentices. And so it goes. School, you know, is a place to get prepared so you can get a job later. Later doesn't mean much in the fourth track."

You see that you have to go, though you are reluctant to do it. Mr. Edwards says, "Why don't you stick around a few minutes until the students come back? We can almost always guarantee something interesting."

When you tell him you have to be back on the campus for a class in twenty minutes he smiles and says, "Well, come back another day—any time you want. You might learn something here that you don't find in the book. Anyway, I did. You're welcome any time—but check with Mr. Johnson first. He's a little nervous about visitors in track four."

The last visit you will make is to another secondary school. This school has the reputation of being the most "advanced" in its program of any high school in the state. It is always listed among the half-dozen schools in the entire country which are said to have adopted the most modern forms of organization, curriculum, and educational method.

For observation

MR. FREDERICK'S SCHOOL

Your visit to this school involves a journey of an hour and a half by bus to a community that has grown up in very recent years around a large industrial and research complex supported in part by funds from various federal research agencies and in part by private industrial concerns.

As the bus enters the limits of the community you see that everything looks new—the houses, the public buildings, even the shops. The man sitting next to you volunteers, "Ten or twelve years ago there wasn't nothing here; just scrub oak and brush. I used to hunt partridge and rabbits out there. Look at it now!" He shakes his head, but whether in amazement or in disapproval, you can't be sure.

You must take a taxi from the bus terminal to the school, which is near the edge of town. The cab draws up before the entrance to the school and before you lies the most impressive high-school campus you have ever seen. In some ways it reminds you of Mr. Johnson's school: the very large site, the low buildings scattered artfully over the rolling grounds. But this school seems to have something more. You decide the only word to describe the difference is "elegance." Perhaps the difference is in the white limestone of the buildings—Mr. Johnson's school was made of brick—or perhaps it is something else.

School is already in session and only a few students are to be seen in the corridor as you follow a sign to the office. There a receptionist takes you to an inner office and introduces you to Mr. Frederick, an assistant principal. Mr. Frederick is cordial and friendly and you soon get the impression that he is accustomed to showing visitors about the school. He suggests that you will probably get most from your visit if he first tells you something about the way his school is organized and how its program operates.

"Do you already know anything about our school?" he asks. You reply that you only know it is famous. He laughs, "Famous, perhaps, depending on how you look at it. We have lots of visitors here. Some of them like what they see and some are dubious. Some, I guess, don't really understand what they see. So much of it is different from the typical high school. If you don't understand the ideas we are experimenting with you often miss the point of what you see going on in various parts of our school. There are many people who say as soon as they arrive, 'I would like to get into a classroom and see some teaching.' Then I have to explain that 'classroom' in this school doesn't necessarily mean what they have in mind—and 'teaching' doesn't either. Then they are likely to get confused or suspicious."

You assure Mr. Frederick that in your visits to other schools you have already learned how important it is to know about the general organization of the school and the design of the program.

"Good," he says, "so let's take a little time to discuss the plan of our school. Then you can go around and observe various things that interest you. The most significant thing about the organization of our school is that it is nongraded. We use an entirely different plan for grouping our students for instruction. There is nothing here, for example, that really can be called tenth-grade English or twelfth-grade mathematics. This nongraded structure gives us a great deal of flexibility in scheduling students for programs appropriate to their needs and abilities—much more than is possible in the typical high school.

"At the present time we have four 'levels' at which a student can work. Actually, 'levels' is not a very good term to describe what we do, but as yet we have not been able to think of the right word to use. Anyway, it works like this. The first level is for those who need special help which can be given only in small groups. This is what most people probably would call 'remedial work.' At this level we try to help students make up the serious deficiencies they have when they come to high school. This is a public high school serving our entire community and there always seem to be some who have insufficient preparation to do the work.

"The second level is for those with less serious deficiencies than those at the first level but who still need help with the basic intellectual skills. The third level is for those who have average ability to deal with the subject matter of the curriculum, and the fourth level is for those who are intellectually gifted and can work with subject matter in much more depth than those at level three. Students in the fourth level can take a great deal of responsibility for directing their own work, and many of them are studying some subjects at what most people would consider the college level."

When you ask Mr. Frederick how students are sorted out for the various levels, he tells you it is done on the basis of the student's level of achievement. "There are two main reasons for doing it this way," he says. "One is that the IQ, which is the basis on which many schools form ability groups, is really an insufficient criterion. The IQ typically is indicative of only a few aspects of intelligence and we think there are many others. The other reason is that in our program here we are trying to promote continuous learning. We want to take a student where he is—whether he is high or low—and help him go on from there. This means that the important thing is his level of achievement and that is what we use. As you might guess, we rely heavily on standardized achievement testing in classifying students at the various levels."

At this point you ask Mr. Frederick about the subjects that are in the school's curriculum. His answer is, "The backbone of our program are the basic disciplines of English, mathematics, foreign languages, science, and the social studies. Every student must include these in his program, though, of course, students with differing levels of achievement study them at the various levels I told you about. In addition to these basic subjects there are various possibilities for electives and every student must include some electives in his program. Physical education is required of all students. There are electives in music; art; various technical studies such as mechanical drawing, electronics, and things like that; home economics; typing for personal use; and driver education."

You ask, "Then you do not have strictly vocational courses that prepare students to get jobs when they finish high school?"

"No," says Mr. Frederick, "we don't have any specifically vocational programs in our school. We believe the high school can give the most effective preparation for vocations by providing the best training possible in the basic disciplines, along with some introduction to technical work—as for example, electronics. Specific skills go out of date pretty fast these days and we don't want to train our students for jobs that will soon be obsolete.

"With us," he continues, "basic education comes first. With our flexible, nongraded organization we can arrange it so a student who is deficient in some skill or subject matter can spend at least two periods a day working on that area and we can keep him at it until he gets up to the minimum standard. We have most of the new instructional devices. For example, we make a lot of use of programmed learning with both teaching machines and programmed books. This helps to give the student more responsibility for his own learning and make him less dependent on the teacher to tell him everything he is supposed to know. And, of course, it frees the teacher from some of the routine kind of teaching and gives time for work with students in other ways. These devices are particularly useful in the first and second levels, though we use them in various ways throughout the school.

"We have also done quite a lot with team teaching here. We're not entirely satisfied with what we've done up to now and we are still experimenting with it. There are different ways of organizing team teaching, but mostly what we have done is to let two or three teachers work together, each teaching the subject, or part of the subject, that is of most interest to him and in which he has the most competence. The team often brings in resource people to help out. Sometimes they come from among our own staff, but very often they are people from the community. We have a great many highly trained people in our community because it is a major research center. Many of these scientists and others are glad to help out in our program.

"Team teaching is difficult to carry on in a traditional high-school schedule, but we don't have that problem. There is no point in a teacher or an expert consultant talking to thirty-five students in a single classroom when he could just as well talk to 100 or 150—it's a waste of time and talent. So we schedule our time so that on the average about ten per cent of the time is spent by students in large groups, about forty-five per cent in small discussion groups, and about forty-five per cent in individual study. We place a great deal of emphasis on the importance of the student's own effort in self-study and an important part of the work of the teaching team is to work as consultants and guides with individual students. You ought to understand that this is more than the old 'homework' idea.

"There is one other thing I want to tell you a little about and then we will go out and see what we can see. We have in our program a provision for independent study. Now by this I don't mean the individual study that is part of the student's work at every level. In this program we make it possible for a gifted student to work in real depth on an area of knowledge that is of particular interest to him. Of course, the students who participate in independent study come from among those who are working at the fourth level. In this program the decision to do independent study really rests on the student. He must submit a plan he has worked out in which he indicates what he wants to do, why he thinks it is important and how he intends to go about it. He also makes a self-analysis or evaluation

of himself on a form we have devised. His proposal, of course, has to be approved by the faculty. We take various things into account in making a decision. A very high level of achievement is involved, of course, but what we really look for are evidences of creativity and imagination."

You ask Mr. Frederick how the program of independent study is supervised. He replies that he doesn't think "supervised" is quite the right word. "The emphasis," he says, "is on self-direction by the student. Of course, students often find themselves in need of help and advice. They are free to see any member of the teaching staff by appointment. We have tried to put as few limits on the program as seems reasonable. In fact, we have only two regulations. One is that the amount of time spent in independent study will be limited to the extent that the student can keep up his work in the other basic areas of the curriculum. We don't want to encourage complete specialization in high school! The other rule is that the student on independent study must confer once a week with the faculty member who is sponsoring his work. Beyond that, he is free, with the help of his counselor, to plan his work on his own."

You ask Mr. Frederick whether independent study programs of this kind are very common in high schools. He replies that they are not, at least as yet, although the program in his school and in a few other schools has attracted a good deal of attention nationally. "I am sure," he says, "that this kind of program works out well only in schools that have a highly flexible program—and most American high schools haven't reached that point yet. You will be surprised," he adds, "when you see some of the investigations these high-school students have conducted."

"Are these investigations mostly in science?" you inquire.

"No," Mr. Frederick replies, "they are in all fields. Of course, we have a good many in the sciences, I suppose because this is a scientifically oriented community and the fathers of many of our students are scientists. But we have had very good work in the humanities and the social sciences, too. Now," he says, "perhaps we should go out and take a look around."

Mr. Frederick leads the way down a corridor and pauses before the double doors of a very large room. You can see through the glass that the walls are lined with shelves of books. When the two of you step inside, you see that not only are there shelves of books, but also many individual cubicles in which students are working. It seems as if every student has his own little "office" which is closed off from the rest of the room on three sides.

"This is our library," Mr. Frederick says in a low voice, "it is designed to facilitate the individual study I told you about and also, of course, our program for independent study. These carrels give students a place to work where there will be a minimum of distraction."

You remark that it is the largest high-school library you have ever seen. "It probably is," Mr. Frederick replies, "but I think if we were building this school again, we would make it even larger—or perhaps have more than this one room. Our program demands that we provide the best possible conditions for study—something you can't get in the old-fashioned study hall or in the typical high-school library, which is much too small and poorly arranged besides. With a program such as ours we should be able to seat at least twenty-five per cent of the students at one time and fifty per cent would be better. With our present enrollment we can take care of about thirty per cent, but enrollment is going up and I'm afraid our facilities may be inadequate unless we can expand in some way."

He leads the way across the hall from the library. Here is another large room with numerous carrels. Students are sitting in their cubicles with earphones on their heads. "This is the language lab," Mr. Frederick says. "A student spends about forty per cent of the time devoted to his work in that subject in the lab. We have programs in French, German, Spanish, and Russian now. If we can arrange it, we will offer Chinese next year. In addition to these modern languages we also have a four-year program in Latin.

"Now," he says, glancing at his watch, "I want you to see one of our large group sessions." He leads the way to a large lecture room, not unlike those in your college. The floor slopes toward the front of the room. There is a low podium and a speaker's desk and behind that a chalkboard and a large projection screen.

A speaker is addressing a large group of students. The room is nearly full and you estimate there must be well over a hundred students in the group. The speaker's voice is amplified and every word can be heard clearly, even in the back of the room where you are standing. The lecturer is talking about classic Greek conceptions of justice. His remarks seem clearly organized and his delivery is forceful. You would like to hear the rest of the lecture but Mr. Frederick motions you outside.

"I'm afraid we can't stay too long in any one place if you are to get a general idea of our school in your short visit," he says apologetically. "The students you saw in there are in charge of a team of teachers for their work in social studies. They meet in the large group once or twice a week. The rest of their time will be spent in small discussion groups and in individual study. This particular group has been studying the concept of "justice" for several weeks. The team plans the work so that all the relevant social sciences get into the picture, not just history. This is not a chronological approach. We gave that up a long time ago. The last time I was in here Mr. Smith was lecturing on Jefferson's ideas. Not long ago a prominent lawyer in town gave a lecture on the meaning of the English common law. There's no telling who will be here next week!"

You remark that the students, by and large, seemed interested and attentive. "Well," he says, "this is a fourth-level group and you would expect them to be. Besides, Mr. Smith is an excellent lecturer. No other member of the team could give the kind of lecture he can, but he is perhaps not as good in small-group work as some of the others. So you see how team teaching makes it possible to use the talents of each teacher to best advantage.

"I suggest we go over to another part of the school, which is designed for small-group work. The part of the plant we are in now has all the large facilities, except the gymnasium and music rooms."

He leads you down a long connecting corridor to another building. Here you see the rooms are smaller—about the size of conventional classrooms. You also pass laboratory rooms in which students are working with various scientific apparatus. Mr. Frederick pauses before a room adjacent to one of the laboratories. He says, "Here is a third-level discussion group in physical science. I believe that yesterday they met in a large group for a lecture and demonstration by one of the teaching team. Today they are discussing the material presented in the lecture. Would you like to watch a little while?" You agree and enter the room.

The teacher has written on the chalkboard "The Laws of Motion." You look about the room to see upwards of twenty students sitting at rows of tables. The teacher is speaking but two boys at the rear are engaged in a conversation of their

own. The teacher pauses and looks sharply in their direction. Then he continues. "Yesterday, we all heard the lecture and saw the demonstration of Newton's Laws of Motion. What is the first law, Charles?"

Charles is one of the two boys who had been talking to each other. He looks startled, then glances at his notebook. "The law of inertia," he says.

"And what is the law of inertia, Charles?"

"Well," says Charles uncertainly, "it's like rolling a ball." Some of the other students raise their hands but the teacher ignores them and concentrates on Charles.

"What do you mean by that?" the teacher asks.

Charles looks more confused. "Well," he says, "yesterday when we had the law of inertia, Mr. Jones rolled a ball across the table."

"Yes," the teacher says, "and what happened?"

"It fell off the table." There are a few giggles to be heard and the boy next to Charles emits a stifled sound somewhere between a snort and a guffaw. The teacher's face reddens a little but his voice keeps its even tone. Charles is obviously playing to the gallery now. You begin to wonder what you would do in this situation.

"Why did it fall on the floor, Charles?"

"Because nothing stopped it. Mr. Jones grabbed for it but he missed." There are more giggles and several students are waving their hands wanting to be called on.

"You say it fell off because nothing stopped it. Does that tell anything about the law of inertia?"

"I guess so," Charles says, looking around to see how he is going over.

"What does it tell?"

"When something is moving it will fall off the table unless you stop it."

The teacher apparently has had enough. He calls on one of the students who has been holding up his hand. "Will you tell us what the law of inertia is, Jack? Some people don't seem to have got much out of the demonstration yesterday." As Jack begins his statement of Newton's law you see Mr. Frederick outside the door and you slip out as quietly as you can.

"How did it go?" Mr. Frederick asks expectantly.

"It was very interesting," you reply.

"Good. Now there is one other thing I want you to see before you have to go. I think you will find it interesting to take a quick look at one of our first-level groups. The students at this level are deficient in basic skills—particularly reading—and a great deal of their time is spent in making up for what they didn't get in elementary school."

Mr. Frederick leads the way down another corridor and stops before a room of moderate size. As you enter you see the room is divided into a main part and an alcove. In the alcove four students are working with teaching machines. In the other part of the room five students are working at individual tables. Two other students are talking to the teacher. Nine of the eleven students are boys.

"We try to run this program on a laboratory basis," Mr. Frederick says. "We have the latest materials and equipment available. You see the teaching machines over there. We also use a lot of programed material in book form. We have visual aids of various kinds. We also have a pretty complete diagnostic center down the hall where we do various kinds of testing so we can diagnose specific reading

difficulties. It costs quite a lot of money, but we think it is worth it. We want to move these people up into higher levels as quickly as we can."

You look at your watch and see that your time is gone. On the way back to the main building you thank Mr. Frederick for his kindness and for the time he has taken in a busy day to show you his school. Then you go out in front of the school to wait for the taxi that will take you back to the bus terminal.

WHAT IS TEACHING FOR?

We said at the beginning of this chapter that what goes on in schools reflects the beliefs and values of society. Why, then, are the schools you visited different from each other in certain respects?

On a broad scale, people within one country hold certain values and convictions in common. But no society is static; values are always changing and may be interpreted and applied somewhat differently by different individuals, families, and communities. When schools are not rigidly controlled by some central agency of government, these differences in interpretation and application may be quite striking. The range you observed in the four schools with respect to the nine factors presented on page 23 gives some idea of the range you will find in the ways our common beliefs and values are interpreted and applied in our schools. As you see other examples in this book and perhaps visit classrooms in your own community, you will get a broader view of this diversity.

As you observed what was going on in these four schools, you may have found yourself approving or disapproving the various activities and procedures you saw. This was a natural reaction. Now try to analyze whether your likes and dislikes were based on what you are used to or on a consideration of what was best for the children involved. What goals do you think had prompted the choice of the methods you approved? The methods you disapproved? Were the teachers' goals being achieved? Usually the goals of teaching in a particular classroom can be deduced from what is done about each of our nine factors. The methods used will depend to a large extent on the nature of these goals.

Some of the differences between the elementary schools and the secondary schools you visited obviously are caused by differences in the age and maturity levels of elementary and high-school students. In one sense, at least, the purposes of the elementary and the high school are different, but would you say these are *fundamental* differences or only those that are occasioned by age and maturational differences? Or, to put it another way, is there an underlying common purpose (or purposes) that should obtain for every level of the school system?

Consider the secondary schools you visited. In some organizational matters they are very different and this, in a brief visit, is the striking thing to an observer. But consider also such a matter as the learning process. How much difference did you find in these two schools with respect to the way the learning process is conceived? Were the teaching methods you observed in the short visits you made to various classrooms really different? If so, how? If not, in what respects were they very similar?

Or, take the question of motivation for learning in the two schools. What differences and/or similarities do you think exist in this respect? Try to be as specific as you can in answering the question. It is granted, of course, that your

visit was too brief to enable you to be definitive, but do the most you can with the data you have.

The examples offered by these four schools provide a small replica of the situation as it exists today in American education. Even though our tradition of free, public education for all is almost as old as our nation, there are still grave questions being asked about what the goals of this education should be and about how much of what a child needs to learn should be the school's responsibility. Much of the controversy over schools in the last decade has really revolved around the question, "What is teaching for?" To be sure, there has been controversy over questions of method and curriculum and other policy matters. But method and curriculum are largely *means* for realizing some set of objectives. Unless we can reach some reasonable agreement on the goals of teaching, we can never have much intelligent agreement on method.

Do not suppose that the question of goals is novel to the twentieth century or that ours is the only generation which has struggled with controversy. In the third century B.C., Aristotle wrote in his *Politics*:

"All men do not agree in those things they would have the children learn. From the present mode of education we cannot determine with certainty to which men incline, whether to instruct a child in what will be useful to him in life, or what tends to virtue, or what is excellent, for all these things have their separate defenders." (Book VIII, Chap. 2, par. 1)

This could just as well have been written today, for it expresses precisely the problem confronting us. Should we concentrate primarily on those things which have practical value in making a living? Should we formulate a program which will contribute to the total development of a human being and help him realize his "humanness" to the greatest degree? Or should we concentrate on mastery of those intellectual disciplines which time and experience have shown to be the products of the greatest human minds? Are these three kinds of objectives out of harmony with each other? Must we choose only one and reject the others? Can we include all of them in our formulation of the goals of teaching? These are not easy questions, and the history of education is in considerable part a history of the efforts of people to deal with them.

The classical tradition

Among the ancient Greeks, particularly the Athenians, education was conceived as all-round development of the human being—physical, moral, intellectual. It was firmly believed that the body and soul worked in such close harmony that both these aspects of the personality had to be cultivated together. It was believed that a sound and effective mind could dwell only in a body that was physically sound and beautifully developed and that disfigurement or underdevelopment of the body would inevitably contribute to the disfigurement of the soul. Therefore, among the Athenians the curriculum was divided in such a way that approximately half of it was devoted to gymnastics for the cultivation of the physical body. The other half was devoted to what the Greeks called "music." This included drama,

poetry, and other intellectual arts. Both parts of the curriculum were regarded as of equal importance.

After the decline of the Greek cultures and during the period known as the Dark Ages, most Greek learning was lost, and for centuries the Greek ideals of society and education were largely unknown. Then, during the latter part of the medieval period, many of the classic literary and philosophical works were rediscovered, and men began to regain some idea of the way of life which had produced these works and to learn something of the educational ideals of the classic cultures.

The influence of humanism

During the Renaissance there developed a great enthusiasm for the literature of Greece and Rome and an ardent desire to recapture the way of life of that era—an intellectual development which came to be known as humanism. There is ample evidence that some of the earlier humanists grasped the significance of the Greek ideal of “gymnastic for the body and music for the soul.” But the net result of the development of humanism, insofar as the goals of education are concerned, was a concept exceedingly narrow when compared with that of Greece.

The early humanists had prized the classic literatures for the way of life they revealed. History shows, however, that this early attitude degenerated in time into a formalism largely devoid of either the spirit or the substance of classic culture. So far as education was concerned, humanistic studies became largely the study of the classic languages of Latin and Greek, and the formal aspect of these languages was stressed above all else. The primary goal of education eventually became the mastery of Latin grammar.

This formalized humanism was directly responsible for the development of the early secondary school. In England this school was known as the Latin Grammar School. Its name accurately describes the goals of education to which it subscribed and reveals the essential nature of its curriculum. When New England was colonized, the settlers brought with them the English idea of the Latin Grammar School. The first secondary schools established in this country were modeled directly on the institutions the colonists had known in England.

Since the seventeenth century, this humanistic concept of the secondary school has undergone modification. New subjects have been added to the curriculum, and to some extent the goals have been enlarged. But even today the secondary school bears the marks of its origin and reflects the failure of humanism to incorporate the Greek ideal that education involves both “body and soul.” Its educational ideals still are largely limited to the principle that the sole business of the school is intellectual training, an idea which would have sounded strange to most Athenians.

Education for the common man

Humanism was aristocratic in its origin. Few people thought that there was anything in the humanistic educational ideal that concerned the common people.

Accordingly, the humanistic school was selective and aristocratic in nature—a school for the rich and wellborn.

It was not until the nineteenth century that the goals of education were considered in terms of the common man and that the ideal of universal education gained ground. Much of the credit for initiating the wave of reform in education must be given to Jean Jacques Rousseau, a brilliant if somewhat erratic genius whose book *Emile* is one of the classics of Western educational theory. Rousseau's sentiments were thoroughly with the common people, and both his political and educational writings are directed against the old aristocratic order—including the kind of schools it fostered. He proclaimed the need for a new conception of educational goals, new conceptions of human nature, and a thorough overhauling of society and its institutions.

Johann Heinrich Pestalozzi, a Swiss, attempted to put into practice the ideals Rousseau had expressed but had never been able to implement. In his deep concern for the lot of the common people, Pestalozzi opened a succession of orphanages and schools in Switzerland. He developed a methodology based on sound family life with emphasis on mild discipline, loving care for children, and religious and moral inspiration. Pestalozzi's influence was great in Europe during much of the nineteenth century. His system of teaching was made the official method for the schools of Prussia by act of the Prussian government. Although Pestalozzi's methods were increasingly formalized by his followers and not all who used his principles retained their original spirit, it is fair to say that education was never the same after Pestalozzi. His statement, made when he opened the first orphanage, that the purpose of education is "to help beggars live like men," still expresses the humanitarianism and social vision that many contemporary educators feel must be a part of our educational outlook.

Whereas the classical humanist doctrine has had its strongest influence on American secondary schools, the principles of Pestalozzi have most strongly influenced the development of our elementary schools. However, you will find elements of each tradition in both divisions of our school structure.

Science and educational goals

The advent of experimental science and the development of industrialism brought new problems for education. Late in the nineteenth century, Herbert Spencer, disgusted with the lag between the kind of education being given in English schools and the realities of an industrialized society, lashed out at education's blindness to social and industrial change. In one of the essays in his book, *Education: Intellectual, Moral, and Physical*, Spencer outlines in detail his belief that education must prepare children and youth for living in the real world and that what is taught must be of use in a complex industrial society. In fact, much contemporary thought about the role of the school in "life and adjustment" can trace its ancestry to Spencer's ideas.

In this country the influence of industrialism and the efforts of educators to adjust the aims of education to existing social conditions may be seen in the seven "Cardinal Principles of Education" formulated by the Commission on Reorganization of Secondary Education in 1918. These were stated as: health; command of

the fundamental processes; worthy home-membership; vocation; citizenship; worthy uses of leisure; and ethical character. Taken as a whole, this group of objectives bears far greater resemblance to Spencer's position than it does to the classical-humanistic tradition.

The outstanding leader in American efforts to design a new education suitable for the twentieth century was John Dewey. Dewey's writings are voluminous and many people profess to find his educational theorizing extremely complicated if not obscure. It has been suggested by an authority on Dewey's philosophy that his whole educational theory is really based on two propositions: (1) educational objectives and teaching method must be based on modern experimental psychology; and (2) education always has some moral orientation; in America this orientation must be the social ethic expressed in democracy (Hook, 1954).

Dewey maintained that the purpose of education is the development of intelligence—the ability and disposition to act on the basis of reflective thought rather than on either impulse or rigid habit. He attacked the body-mind dualism which is implicit in most Western educational theory. The human being, he said, is not composed of two separate entities, a physical body and an immaterial mind. Biologically and psychologically man is a unity. Doing and knowing are both aspects of a single process of behavior, and they cannot be separated.

Consequently, it is impossible to divide education into the purely intellectual and the purely practical. Concepts, ideas, facts have meaning for a person only as they enter actively into his own experience and as he uses them to understand new ideas, solve novel problems, and manage his affairs more effectively.

What we ordinarily call knowledge, Dewey thought, could very well be called "preserved experience." But, he said, the ideas which make up this preserved experience are incomplete ideas. They become complete and therefore meaningful to a person only when they play an active part in his life. The primary value of knowledge lies in its potential help to us in meeting the new situations which present themselves in our own experience.

Education always has some ethical basis which gives direction to what schools attempt to do. A democratic society, as Dewey saw it, is one that takes seriously the propositions that all men are equals and that the human personality has intrinsic worth. A child's experience in school, he felt, should help him to understand these ideals and lead to his acceptance of them.

At the level of social affairs, the democratic ethic implies what Dewey called "shared intelligence." This means both the right and the responsibility of every citizen to participate in the making of policy. A democratic society lays heavy obligations on its members; but the alternatives to shared intelligence are either anarchy or some form of authoritarianism.

The habits of cooperation and participation which the citizen of a democratic society must acquire are difficult to learn. Dewey thought that from the very beginning children should be helped to develop self-direction and a sense of responsibility for the welfare of others. It seemed clear to him that the school should play an important role in this kind of learning.

Dewey's great effort, therefore, was to lead the way in designing an educational program for the twentieth century that would embrace both the fruits of scientific method and the American ethical tradition of humanitarianism and moral equality.

We find ourselves today in a great turmoil over the question of "What is teaching for?" Each of the traditions here mentioned still has its powerful spokesmen. Speaking for the classical-humanistic tradition are such men as Mortimer Adler, Robert Hutchins, Arthur Bestor, Gilbert Highet, and Mark Van Doren. Speaking for the tradition sometimes loosely called "progressivism" are those who are largely followers of the tradition of Rousseau, Pestalozzi, and John Dewey. Among them are John L. Childs, Sidney Hook, William H. Kilpatrick, George S. Counts, and Harold Rugg. Often the differences appear irreconcilable. Some people have thrown up their hands in despair. With such differences in traditions, values, and convictions, American educational policy, they say, is doomed to drift amid vacillation and controversy.

There are those, however, who believe that we can achieve a new synthesis—a design for educational objectives which will retain the valuable portions of the older traditions and yet incorporate the realities of life in an industrialized and closely interdependent society.²

These considerations raise some interesting and controversial questions about the relation of psychology to educational theory and practice. Psychology, it is now widely recognized, has attained the status of a science—although it is perhaps not yet a mature science in the sense that physics and chemistry are. This has led many psychologists to the conclusion that psychology, as a science, is concerned exclusively with description, classification, and analysis of the various phenomena of human behavior. In other words, the scientific psychologist sees himself as being concerned with the "how" of human behavior and the laws that govern it, but not with what it *ought* to be. The *ought* is left to somebody else—the philosophers, perhaps, or the theologians, or both.

In educational psychology, which is an "applied" science in the sense that it deals with the application of principles from pure psychology to the educative process, the same attitude is often found. The educational psychologist, it is said, is properly concerned with telling us *how* we may develop methods appropriate to our objectives, but the objectives themselves are not his concern—at least as a psychologist. What we *ought* to strive for in our schools we must leave for somebody else to say—the educational philosopher, perhaps.

There are others, however, who view this division of labor as unduly arbitrary. They are willing to agree that in some respects the educational philosopher is fitted by interest and training to deal with the problem of educational objectives—particularly because, as is widely recognized, education always has ethical dimensions and ethics is usually thought to be the proper province of the philosopher. Similarly, education always serves some kind of social purposes and what these *should be* may not be a primary concern of psychology.

²For an expression of the humanistic point of view, see "Adjustment Versus Education" by M. Smith (*Vital Speeches of the Day*, 1955, 21, 1453-1457). A statement in the tradition of Pestalozzi and Dewey is *Life Adjustment Education for Every Youth* (U.S. Office of Education, 1953). An attempt to clarify the common ground between the contenders is "Let's End the Name-Calling," by R. C. Bryan (*Educational Administration and Supervision*, 1955, 41, 193-201). A still different approach to what education should achieve in modern America is suggested by Margaret Mead in "Why Is Education Obsolete?" (*Harvard Business Review*, Nov.-Dec. 1958, 36, 23-30). The conflicts to be expected from trying to graft a "tough curriculum with accent on science and math" onto a school system rooted in as fun-loving and self-indulgent a society as ours are explored in "An Anthropologist's View of Curriculum Change" by J. Henry (*Teachers College Record*, 1961, 62, 541-549).

But those who argue in this vein also point out that moral and ethical sensitivity and social insight are not in the exclusive possession of philosophers. And, in fact, various distinguished contemporary philosophers, who have taken an interest in educational theory, insist that the social and behavioral sciences have an important contribution to make in the determination of educational objectives. Their point is that psychologists, sociologists, political scientists, philosophers, and educational theorists all have a part to play in the determination of the aims of education. Their roles are not identical, to be sure, but all of them are important.³

Perhaps the primary leadership in this reformulation will be taken by educational philosophers, but psychology has a significant part to play. Through its study of behavior, psychology shows us what kind of guidance will help a child grow and develop into a healthy, sensitive, responsible adult and what the role of the school can be in providing that guidance.

As a teacher, you may some day find yourself in a classroom like one of those pictured in this chapter. You may be required to live with and work with children similar to those you have seen here. What teaching methods will you use?

Only in the light of your understanding of the goals of education will you be able to evaluate methods of teaching. You will have to accept or reject methods on the basis of whether or not they contribute to the result you want. Through the chapters to follow, you will be finding out what methods lead toward which results. Knowing these relationships, you will be able to choose your methods with open eyes.

Reading

Herbert A. Thelen

SOME CLASSROOM QUIDDITIES FOR PEOPLE-ORIENTED TEACHERS

The author of this selection raises some important questions about what is taking place in classrooms. Are we really educating our pupils? Or are we merely subjecting them to a process of socialization? He goes on to discuss some of the natural tendencies that are found in the classroom group—tendencies the teacher can either suppress or encourage. He outlines some of the ways in which the wise teacher can take advantage of these tendencies in helping his pupils become truly educated.

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³A valuable discussion of relative roles in the determination of educational aims is to be found in Charles S. Stevenson, "The Scientist's Role and the Aims of Education" (*Harvard Educational Review*, 1954, 24, 231–238). A good many years ago William Allen Neilson observed that the most strictly physiological psychologist usually becomes a philosopher before he dies. ("Future of the Humanities," *Harpers*, March 1943, 186, 389–391). In retrospect, this seems to have been true of such noted early behaviorists as Edward L. Thorndike and J. B. Watson and, in the present day, of B. F. Skinner.

To an objective and impartial behavioral scientist (like me), practically all classroom discussions (except yours) are self-flagellating activities in celebration of a monstrous and unnatural educational (?) tradition. The major effect of this tradition is the flouting of most of what we now know about the circumstances under which experiences in groups are meaningful and/or productive.

Reluctantly eschewing the promise of further polemical goodies anticipated by this statement, I shall present the grounds for my judgment, consider the sacred beliefs that maintain the tradition, and then paint a picture of an educative classroom. For those of you who remember the old story, I shall play the ant to your grasshopper.

Let me begin with a proposition that seems unassailable: that "society" puts a lot of time and energy into sending children to school because children cannot be counted on, by themselves, to learn the things we say they "need" to learn. Schooling is expected to alter their behavior and attitudes through (a) causing them to *engage in* certain activities (e.g., reading, experimenting) they are not likely otherwise to engage in, and (b) supervising this participation in such a way that the child will *learn from* it the lessons we think are important. Engagement and learning are two different things, namely, a and b, and they are worth distinguishing. It is possible for a child to go through a programmed text, making all the required responses correctly, and then not remember any of the ideas he has been dealing with. It is possible for a child to work through a chemical experiment in the laboratory manual and still not be able to say what he has seen and what principle it illustrates. It is possible for a child to study spelling for seven years and still not be able to spell. It is possible for a man to engage in churchly activities all his life and still be spiritually unwashed; for a business man to engage in one business activity after another and end up broke. (And for a professor to study education for 20 years and still not have any different or new ideas.) It is one thing to engage in activities, producing socially demanded and acceptable behavior; it is another thing to learn anything from the experience—except, possibly, how to play roles.

One thing that happens to most children in the classroom is that they learn to play the roles required by the teacher. There are many who do not learn even that; we call them "culturally deprived," or we label them "problem children." The existence of the whole body of lore known as "classroom management" testifies to the fact that with respect to most children some of the time and some children all of the time, we have difficulty in getting them to engage in the activities and produce the role performance we want from them. These difficulties are problems of socialization of the child. Most college teachers get the roles they want to the extent they want them because they deal only with children who have already been more or less successfully classroom socialized.

Difficult as it is to achieve socialization in some situations, education—the process of learning useful things from participation in activities—is even harder to come by. Socialization is transactional and has a visible component of overt behavior. You can condition a child to do math homework because you can identify behaviors to reward and punish. But education proceeds through covert and sneaky processes of internal reorganization of thoughts and feelings. You cannot even find the behavior to reward or punish in order to make math homework *educative*. You can train the child to make the right reply to a question, but you

cannot force him ever to use the idea for any other purpose. We occasionally have Ph.D. candidates who have been socialized or trained over the years to make acceptable responses on tests and yet cannot think up a research proposal (let alone commit themselves to it) to save their lives. Those learnings which are justified primarily as attributes of an "educated" social class may be considered the fruit of socialization, not education. What the "culturally deprived" child is deprived of is, to some extent, "culture"; but what irks the teacher is his lack of socialization in the pleasantries of toilet training for the middle class.

It seems to me, then, that classrooms as now constituted are primarily instruments of socialization rather than of education. The successful student participates properly in activities and learns to produce the consistently demanded responses (becomes test-wise). And, after so many years of it, he is accorded entry into the social class known as "college graduates." At this point, certain jobs are open to him and others are closed; and a host of social expectations define his probable position in society. The socialization we produce is aimed at creating "good" members in organizations, and we react to and deal with the child's talents primarily with this end in view. . . .

There is much criticism of our schools today. Most of the critics—at least the noisier ones—seem to be arguing that our schools are ineffective as judged by the sacred educational tradition, whereas I am arguing that it is the educational tradition itself that is at fault. Moreover, as experience in large cities is showing more clearly every year, the tradition is becoming faultier all the time. . . .

To be able to direct our own thinking about a body of phenomena, we need to assert a proposition about how we intend to seek understanding. I submit that the most significant and inclusive proposition for illuminating the study of teaching is that *in any situation there are some tendencies "going our way" and some going in other ways*. The teacher's job is to maximize the first and minimize the second. He must set such conditions as are under his control in such a way that whatever educable tendencies the child has become actualized to a greater extent than tendencies in other directions. But—and here is something many teachers would like to forget—the teacher has to deal with *both* sorts of tendencies, for conflict between the two types is the normal condition of the learner at the beginning of a new unit or activity; and the teacher's behavior decides which kind of tendency will dominate. To a high degree, the art of the sophisticated teacher manifests itself in the ability to capitalize on the wide range of natural tendencies that exist in the class: to work with them rather than suppress them and to teach the child socially constructive, higher-reward behaviors through which his tendencies can be expressed. Thus, for example, behaviors which express resistance and opposition to the work and to the teacher are capitalized on by one teacher and their energy is channeled into useful learning; whereas another teacher attempts to punish or suppress them. One teacher accepts any and all responses as challenges and weaves the contradictory and inconsistent behaviors of the students into a reality-seeking dialogue; whereas the other teacher acts like a censor, calling the responses he wants "relevant" and the others "irrelevant." For his students, the experience is one of continually trying to guess what the teacher has in mind—up to the time when they find out that the reward they can get is incommensurate with the effort. (From then on, they simply seduce the teacher into giving his lecture, which is what he really has been wanting all along. But who listens?)

What, then, are these "natural tendencies" and under what conditions do they occur? Let us "walk through" a lesson being taught in the classroom.

Consider first the natural tendencies through which persons get "involved." At the beginning of a lesson, the teacher hopes to get the students "involved," interested, intrigued, "ready" to learn more. The tendencies he needs to facilitate are those through which the student "takes on" some part of the environment and has thoughts and feelings about it. There are (at least) three tendencies that can be capitalized on: (a) if stimuli are too sparse, the tendency is to "fill out" the picture by speculation (projection); (b) if stimuli are overwhelming, the tendency is to select certain ones and ignore others; (c) if stimuli violate expectations, the tendency is to try to rationalize away the inconsistency.

The teacher capitalizes on these tendencies, respectively, when he (a) presents a chemical demonstration silently and then asks the students to decide what were the hypotheses, the data, and the conclusions; or when he hands the student a document and asks him to reconstruct the way of life and community out of which the document came. To "overwhelm" (b) calls for a "rich" experience: a field trip, a dramatic movie, an exciting role-played scene. The invitation that unleashes the tendency is simply the question: What is the thing that strikes you as most important (significant, interesting, troublesome, and so on) about the field trip, movie, or other? That is, given all these things we might talk about, what things do you have the most need to talk about? The third tendency (c) is set in motion when expectations are violated: the demonstration that doesn't work, the prediction that fails, the behavior that is unexpected. Professor Bruner thinks that children have intuitive feelings about such things as levers and weights; and when the yardstick balance tilts up instead of down, the pupils become highly "involved." Any unaccustomed behavior of the teacher will involve the students and preoccupy them; and if the unaccustomedness is related to the subject discipline, it may develop readiness to learn; but if it is related to interpersonal manners, it is more likely to develop readiness to react defensively to the teacher—which is not the same thing.

In short, speculation, selection, and resolution of inconsistency are behaviors most persons "normally" engage in when given the opportunity. To get the students to do these things, the teacher must give them the chance; and he does this by carefully arranging the input from the environment.

The two most usual ways to prevent these normal tendencies from taking over are: (a) to make oneself (i.e., the teacher's person) the object of concern, and this is easily accomplished by threatening behavior which arouses interpersonal anxiety; and (b) to do all the work oneself, so that the students really have no role at all except that of bystanders.

Consider second the tendency of "involved" persons to seek "meaning." When most persons are "involved" in something, they tend to want to talk about it with certain other persons. These other persons do not normally include the teacher; the other persons are peers, and, more especially, friends. The need, following initial involvement and arousal, is to "get hold" of the experience both emotionally and conceptually, and this requires one to formulate thoughts and name the feelings one has. This is a risky enterprise, and it calls for interpersonal support from someone who has neither the power nor the inclination to engage in reprisals for what may turn out to be deviate or antisocial thoughts and feelings.

In a classroom, after getting the children involved, the teacher actualizes this second tendency most effectively when he asks them to select themselves into small groups to compare notes and decide what they think and feel about the confronting involvement situation.

The tendency to associate with others in order to cope with one's own feelings, doubts, and anxieties is the fundamental cause of "friendship" or "psyche" groups, such as bull sessions. When members of a large group, such as a class, are forced to associate with one another day after day, smaller psyche groups form; students, we say, begin to "relate" to one another interpersonally; and, especially when the lesson is dull, they fill in the void and the anxiety it produces by talking with one another. (This annoys many teachers, and they seek advice on "classroom management"; they hope to suppress this busy-buzz, this "inattentiveness," these cliques. A tug of war develops between teacher and class, and the teacher is likely to resort to threats and punishment: he makes and enforces "rules," preaches, punishes by making the lesson even duller. In short, he tries to suppress a very basic and very natural tendency instead of either arranging to capitalize on it or setting conditions under which the tendency is minimized.)

Consider third the tendency to seek closure amidst semi-conflicting and untested opinions. After finding out that one has many different ideas, and that his friends have additional ideas, one seeks to know what is "right" or "true." That is, to seek authority (authorization, legitimization) for an answer rather than to leave the perceptual-cognitive field wide open. But this is not a strong tendency because the psyche group, through its "acceptance" of ideas and its nonreprisal basis of operation, actually encourages toleration of all personal or subjective opinions — which is why it works so well in encouraging people to formulate and express their ideas. In effect, for the truth-seeking (or rationalizing) tendency to be strong, we have to reverse the field of the small subgroups. This reversed field can be found in the *class-as-a-whole*, a miniature society with an authoritative leader, with interpersonal competition for recognition and scarce rewards (grades) and (most important for learning) with a sense of common purpose in planning and carrying out activities. To distinguish it from the psyche group, Jennings named it a sociogroup; or it could also be called a "work" group.

When the teacher brings the class back together, he has the problem of capitalizing on the wide range of ideas the students have just formulated and rehearsed with one another. There are three ways in which he might proceed. He could ask the class what they think is the *right* answer to some question that was presumably introduced along with the confronting stimuli: What do you think this document is? What was the purpose of the silent demonstration I showed you? In the ensuing discussion, he would respond (in effect) with "right" or "wrong" to whatever the students said. He would, presumably, be noting which students were right or wrong, and they would understand that this would influence their grades. He would also, probably, compliment the right ones and ignore, correct, or punish the wrong ones. A second possibility would be to ask for the *best* answer, thus inviting students to try to "top" one another. Focus on the right answer appeals to desire for certainty, whereas focus on the best answer invites competition.

Seeking authoritative answers and competing with others are indeed natural

human activities. But encouragement of these by the teacher is less educative than a third possibility which depends on the sociogroup's sense of common purpose. Under common purpose, cooperation rather than competition is dominant; for the members join forces to cope with some situation, achieve some objective, meet some demand made on the group as a whole. The chief requirement for the cooperative situation is that each individual believes that he needs the others in order to do something he needs or wants to do: in other words, he is a member of the group in order to put his contributions together with those of others in order to get something done that he cannot do by himself. If the others are to help him in this undertaking, then it follows that they, too, must value the undertaking (for some reason); and to proceed effectively, there must be some agreement on what the undertaking is and what its purposes are. It is by no means required that the individuals must want or value the undertaking for all the same reasons (which is lucky, because such a condition never occurs); but it is required that there be public agreement and understanding of at least the conditions external to the group that their activity is to change.

Thus, for example, the class can agree to design and carry out an experiment. This requires that they decide what objects to manipulate through what actions, but it does not require that all the students achieve or even seek the same personal gratifications. To one individual, the experiment is a situation in which to imagine himself a scientist; to another, it means checking some hunches against nature; to a third, it might mean mostly taking on a challenging task and completing it successfully. Cooperation, then, is the coordination of roles taken by the students as members of the group, not the development of identical personal views and feelings.

We conclude, then, that following the free exchange in subgroups, the teacher should draw out the opinions of the students and then invite the group to plan some further activity. In the planning discussion, opinions are neither *right* nor *best*; they are useful. And the reward comes not from the teacher as authoritative expert nor as encouraging father but rather from the satisfaction of influencing the class through its adoption of or "building" on one's ideas. The teacher's role under these conditions is that of methodologist-consultant, helping the class put its ideas together, confronting them with further facts in order to get them to sharpen, qualify, or assess the usefulness of their ideas.

So far, we have considered three tendencies: (a) the tendency of persons to get "involved" under certain conditions; (b) the tendency of psyche groups to form from "involved" persons so they can come to terms with their own involvements; and (c) the tendency, in sociogroups, to assess ideas and give them some backing more authoritative than personal hunches. These tendencies, properly encouraged, produce some of the most important activities of educational learning.

The class, like most other groups, either alternates or blends the two characters, psyche and socio. The artistic teacher knows when to "push" on the task and when to "break the tension" by encouraging more intimate and expressive behaviors. The student has a place in both the psyche and socio structures: sociometrically, he is part of a friendship network; in relation to tasks, he has a reputation and a range of roles that people come to expect of him. To be secure, he needs to know (or at least not be anxious about not knowing) his place in *both* structures.

Let us look at the teacher's use of the sociogroup to help students follow up the ideas they expressed in their small psyche groups. I think that seeking authoritative "truth" (right answers) and competing with others for scarce rewards (best answers) may well express tendencies in *individuals*, but I do not believe that carrying out these activities is a legitimate or natural purpose of groups. Groups do not get together to see who is right, and they do not get together merely to engage in intermember competition. These things can go on in groups, but then only for reasons that should not exist in the classroom. . . . On the other hand, planning and carrying out activities together and on behalf of the individuals is, of course, the whole rationale for society.

You can now see the basis for my opening blast in which I characterized present classroom groups as monstrous, artificial, maladaptive, and so on. Neither of the two proper reasons for getting together in a confined space and talking exists in the usual classroom. When the students try to operate like a psyche group, the teacher suppresses them. And the opportunity to act like a sociogroup is denied them because the teacher has presented them with no particular challenge they have to meet interdependently, as a group—rather than collectively and in parallel, as it were. The usual classroom group is a botched-up mess because the teacher wants to have some group characteristics and some nongroup characteristics at the same time, and he wants to be free to take whatever he wants and ignore or suppress the rest. Thus when it comes to most discussion, which goes back and forth between the teacher and a succession of pupils, the teacher wants a collective conversation, a series of one-to-one interactions which he hopes, somehow, will deal with each participant individually. From this standpoint, group discussion is intended to approximate a series of semi-private individual conversations. But on the other hand, the teacher is also talking to the bystanders, and some of what he does to the current participant is really intended for them. Such behaviors tend to include presenting further information, but mainly, I think, they have more to do with setting standards for the group. If the teacher wants students to "think critically," by the time he has responded to the first eight discussants he rather expects the ninth to show some evidences of "critical thinking." My own impression is that the teacher is making a series of case demonstrations to the class, and that what he is demonstrating and defining is the role he wants the students to take in the remainder of the discussion period. . . . In a word, the teacher wants each individual to play with him the games he has in mind, but he wants the group to set standards that will put further pressure on the members to play these games.

What about teacher lecturing? Is this also a monstrous and unnatural situation? Is there a natural tendency for persons to come together, not primarily to reduce anxiety among friends or to do a job, but simply to hear some speaker? If so, how does that fit into the psyche-socio distinction?

. . . I think people come together voluntarily to be taught when there is something that it is important for them to learn, when there is a real use for the information, when some valuable activity over and beyond the "activity" of listening is contemplated. In other words, under sociogroup conditions. If you have ever run a human relations training group or a cooperative research seminar, you will recognize what I am getting at: there are times when groups with shared purposes need organized information, know that they need it, and will

listen avidly to it. And at these times, a 20-minute lecturette will "cover" more ground and produce more results in changed behavior than will eight hours of lecturing under the more usual circumstances. Perhaps we had better take a minute to get a "fix" on this argument. I said that learning begins in a confrontation, and I listed three sorts of activities—speculation, selection, and conflict reduction—as producing "involvement" by capitalizing on normal spontaneous tendencies in the three appropriate stimulus situations. Then I suggested that the "involved" person tends to seek safe people—friends—to try out his ideas on and, in the process, become aware of them. This, I alleged, would develop "readiness" for several possible kinds of further activities; and these are the activities through which one moves from the private and semi-private subjective world to the public world. In this public world, one seeks to have a place, to participate in the culture, to define his role, to know what to count on by way of tested, accepted, or true ideas. But I argued that the public world, society, exists because there are jobs to be done, functions to be carried out vis-à-vis the environment, and that the natural, spontaneous, and potent reason we know instinctively that we have for moving into this world is that most of our needs must be met interdependently.

My position has been that to the extent that teaching can build on these natural tendencies and rationales, the better and more educative it will be.

The conclusion as applied to the classroom group is that its purpose should be to plan and carry out activities in pursuit of shared goals. Under such "natural" conditions, morale would be high, students would be "involved," and management problems would be practically nil because the demand of the job would impose a legitimate and understandable "discipline."

You may feel that what I am pleading for is a voluntary association of learners, and you are right. You may agree with this as being nice, but also tell me that carrying out projects is not particularly educative and that, anyway, in your subject (foreign language, math) there are not any good projects to carry out. To which I will reply that I know what you mean, but am a lot less ready to reach that conclusion. Let me add a couple of comments.

I think that much of the feasibility of my behavioral science approach for education will have to rise or fall by our understanding of the discipline of our subjects and, more especially, how we locate inquiry within the discipline. The two major alternatives are: (a) the discipline of the subject is confined to knowing the ideas as organized by someone else and as sampled by achievement tests (in which case everything I have said is a waste of your time and mine); and (b) the discipline of the subject is an orientation meta-theory and methods of investigation of phenomena comprehended in the corresponding field of knowledge (in which case the activity of the sociogroup is *cooperative investigation of phenomena*). If you see education as society's provision for helping people cope with the world, then, in a world of rapid change like ours, education must develop the primitive but natural capability of inquiry; if you see education as society's provision for locating each person in some segment in which he can "belong," then education must be concerned only with developing common discourse and vocabulary among groups of students sorted out in terms of the social groups to which they shall belong. Except that I would call that socialization rather than education.

Part **2**

UNDERSTANDING THE LEARNERS

Growth, Development, and the Early Years

Elementary-School Children

Adolescents

GROWTH, DEVELOPMENT, AND THE EARLY YEARS

The evolution of the child's behavior is a subject of vital interest to teachers. What comes "naturally"? What must be taught? What are the limits of teachability—are there things some children cannot be expected to learn?

Even the nursery-school teacher will find that much learning has taken place before the child enters her classroom. Once formal education begins, the school adds its molding force and later teachers must take into account prior educational experience as well as home influences.

In studying this situation we are faced with the most fundamental riddle of psychology: What is human nature? How does experience act to modify or establish whatever is given, producing the behavior repertoire of any child at any particular age? It is clear at once that there are two parts to this problem: (1) what is provided by original (and genetically determined) nature and (2) what is added through learning. There is no real agreement among psychologists as to the relative potency of either.

Take the question of what man as a species would be like were it not for environmental influences. This involves some degree of speculation, since man, of course, can only exist within some kind of environment. In oversimplified terms, there is a range of theories about human nature. One extreme holds that, whatever the essence of human nature, it is positive in terms of native inclinations. That is, we are essentially loving, social, creative beings if environment does not interfere. We have within us the seeds of socialization, and the function of external stimulation should be to nourish this potential and not distort it. At the middle of the scale are the psychologists who see human nature as simply a neutral potential for learning with no inherent propensities in any direction. The behavior patterns we develop are seen as a consequence of the type of stimulation we have

been subjected to and the rewards or punishments which have accompanied the responses we have made. At the other end of the scale are the psychologists who, like the first group, see an active human nature with needs and strivings, but who consider these strivings to be anything but beneficent. Self-seeking survival and aggressive impulses are considered dominant. From this point of view, to allow human nature to unfold would be to encourage antisocial behavior. The native endowment must be subjected to considerable restriction through socialization, and even then the veneer of civilization is thin.

Each one of us holds some position on this scale of concepts regarding man's original nature, and our position will influence our ideas about learning. Those who believe in the unfolding of positive qualities will strive to prevent unfortunate interference or pressure from the environment. The other two positions depend upon environmental influences for the formation of desirable traits, though there may be disagreement as to how the learning takes place.

To the present authors, the two keystones of development are the *plasticity of the human organism* and our *differences in inherent potential*. Beyond the reflexive systems which provide for survival, there appears to be a vast range of behaviors which the child can learn. Whether affection is more "natural" to human beings than aggressive behavior is of less importance than the universally observed fact that most human beings seem well equipped to respond either way or even both ways. Whatever we are, we have a vast range of potential, but if things are left to chance one cannot anticipate the evolution of satisfactory response patterns. Just as evident as the flexibility of human nature is the observation that no two of us are alike. There is some variability within the species to start with, and variability increases with age. Hardin (1962), discussing biological variation, reports that some males have eleven times the sex hormones of others, and one may be forty-two times as able to detect moving objects as another. Just what such differences imply for human learning is difficult to determine, as Hardin indicates, but certainly driver-education instructors should be interested in the latter difference.

NO TWO ALIKE

What are the "differences" which are of high importance for teachers? Again it is evident that differences as we see them are not just inborn. Whatever was there to start with has been muted or accentuated by experience by the time a teacher sees the child. What this adds up to is a most subtle and complicated interaction between specific environments and specific endowments, much of the environment being unplanned and even unrecognized.

Let us take a few examples of differences among children of various age groups as illustrations of the statement that the same conditions may not always have the same consequence.

1. *Physical differences within the "normal" range* There are certain standards of physical attractiveness which are quite generally accepted in our society. All parents want their baby to be pleasant to look at, well formed, and so on. As the child grows older, if it is a boy, strength and build are important; with a girl, standard proportions are all to the good. Ungainly, fat, or dysplastic children have

a hazard to contend with. The behavior of sickly or "delicate" children will be molded to some extent by their physical condition. (Acne at adolescence is also a great molder of self feelings.) But if those in his environment do not put too great a stress on surface beauty, the homely child may develop a sense of security based on "inner" beauty. That is to say, a wise and loving family will not allow lack of physical attractiveness to have its typical effect. And the boy who is not strong may find a happy style of life without being held back by this limitation. How catastrophic any of these conditions will be lies not in the condition itself but in the response it brings forth from the environment and, in turn, from the child himself.

2. *Differences in rate of development* Males, initially more vulnerable, maintain this dubious position and mature—on the average—well behind their female counterparts. But no child is an average; he is only one of those who make up the average. Thus one girl may be far behind and one boy rapid in his growth. Some of the implications of early and late development will be examined in the chapter on adolescence. Those children who develop early are seen by adults as more mature (which of course they are in some respects) and consequently are given responsibilities in keeping with this perception. This experience in turn encourages greater maturity, with the result that they may in fact become suited for the role that is thrust upon them. What about those who catch up later? One investigator reports that:

Once the distinctions had been established it appears that a shift by the LM [late maturers] toward greater maturity of physical appearance and behavioral traits did not necessarily produce a concomitant change in their reputation and status within the peer culture. (Eichorn, 1963, p. 38)

3. *More severe deviations* There is another kind of difference which teachers should bear in mind in a culture which looks favorably upon only those deviations which are above the mean. There are children born with motor dysfunctions which are evident in the way they manage their bodies. Sometimes we see it in gait or in poor coordination in throwing a ball, working a puzzle, or writing. If there is difficulty in muscular control due to brain damage, the condition is called *cerebral palsy*. While the CP child may be otherwise normal, he will need help if he is to keep the effects of his disability to a minimum.

Other children start with special neurological limitations in the way they can respond to their environment. They may have difficulty in taking in stimuli (perception), in organizing, storing, and patterning information they do take in (memory, cognition, etc.), or in expressing themselves (speaking, writing, drawing, etc.). Minimally brain-damaged children often have difficulty with language and reading, even though their overall intelligence test score may be average or better. Unless their handicap is understood and accepted by parents and teachers and unless special techniques are employed, such youngsters may find that being "different" spells only problems. Even with all the help their environment can offer, it will not be easy for them to learn (Cruikshank, 1966).

4. *Differences in activity level* Mothers report that some unborn children are extremely active. Others are so passive as to cause worries of possible stillbirth;

yet they are found to be normal. This variability continues after birth, and children differ greatly in the degree to which they engage their environment. Some babies are quiet and shy. Others make their presence known with vigor, and their parents have very few dull moments. Later on, some are content to sit and play; others must explore and investigate everything within reach. Frustration tolerance and attention span differ markedly. Some children are easily diverted from the knife which is sharp to the spoon which is safe; others have single-track minds. Of course, whatever the child's original inclination, experience is also at work. The interaction in one family may encourage the sedate child to maintain that posture; another family may take delight in the active one and encourage his behavior. Or the reverse may be true in either case, serving to mute the original tendency. The point is, whatever the child's inclinations are, they bring a response from the environment, and no two environments will make the same set of responses.

5. *Differences in talent* Finally—and there is a great preoccupation with this in education—children are certainly different in their talents. Some are bright, some are dull. Some have an ear for music and some are tone deaf.

The child born with significant intellectual limitations has a cross to bear, and so does his family. And later the school, too, must share the burden, for he will have trouble learning at the rate and with the depth of his fellows. On the other side, there are children who are so bright that they, too, disturb the pattern, although this is usually a source of pride. But there are likely to be times when being out of line gets the bright child no gold stars in school, though this should be the place his difference is best responded to.

What does it mean never to have the answer, or always to be last? What does it mean to be first, and impatient with the others? The meaning depends a great deal upon the way the environment responds to the behavior.

What we are saying, essentially, is that all differences generate potentials of one kind or another. In summarizing an extensive study of preschool children, Lois Murphy (1962) discusses some of the effects of differing potentials. She suggests that children with low sensitivity, reactivity, and drive coupled with good developmental balance "will function smoothly and naturally with moderate encounters with the environment" (p. 340). On the other hand, the high-drive, high-reactive child with good balance will have more confrontations with his environment and a more complex emotional life. If this type of child has poor developmental balance, there will be more problems in developing means of coping with the environment and a high risk of disappointments. Thus individual differences in drive and sensitivity interact with differences in the environment, and the results of the encounter may be anywhere from placid to problematic. Perhaps this is what parents mean when they say that a particular child was easy to bring up while another was almost impossible.

Human nature is multifaceted and flexible; the same potential may have different results depending upon whether the environment encourages or discourages it. This is the wonder of the human organism, and it is the challenge of the family and the school. We are what we are partly because we were born that way and partly because we were brought up that way. The school is a major arena for interaction—the point of confrontation of the individual with his given particularities and the environment with its unique set of demands.



A child's home environment and the interests of his parents are a part of what he brings with him to the classroom. The child whose home is filled with books and whose parents find their recreation in chess and similar intellectual pursuits will find a familiar set of values in the classroom and will be much more at home there than will the child whose family reads nothing but the daily TV listings--regardless of their respective socioeconomic levels.

HOW FAMILIES DIFFER IN IMPACT

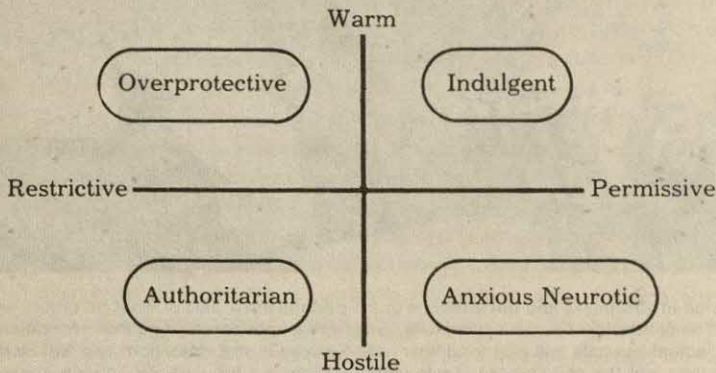
We have already implied the difficulty of sorting out particular patterns of experience and relating them to particular consequences. Whatever design of environmental stimulation we select to study, it will be less homogeneous than we might wish and will be operating on children who react differently. Nonetheless, psychologists--particularly social psychologists and child psychologists--have devoted a great deal of time and effort to studying family patterns and their typical effects.

There are endless configurations to study: What are the effects of birth order, of parental rejection, of mother-dominated families, of divorce, of anxious parents, of striving parents, of lower-class families, of urban living, and so on and on. Many of these variables have been investigated extensively.¹ Caldwell (1964), in a

¹Research concerning family influence on general personality development is reviewed in *Review of Educational Research*, 1964, 34, No. 5, and in "Family Structure, Socialization, and Personality" by J. Clausen (M. L. Hoffman and L. W. Hoffman, Eds., *Review of Child Development Research*, Vol. 2. New York: Russell Sage Foundation, 1966). Another good source is *Child Rearing: An Inquiry into Research and Methods*, by M. R. Yarrow, J. D. Campbell, and R. V. Burton (San Francisco: Jossey-Bass, 1968). Many attempts have been made to find relationships between particular home factors and the school behavior of children. One such study, showing some of the methodological difficulties in this type of research, is reported in "School Children's Problems as Related to Parental Factors" by J. Rouman (*Understanding the Child*, 1955, 24, 50-55). A collection of problem cases with particular attention to what the school can do to prevent and alleviate individual problems is *The Elementary School Child: A Book of Cases*, by C. V. Millard and J. W. M. Rothney (New York: Holt, Rinehart & Winston, 1957).

masterful summary of research and theories concerning the effects of parental practices on infant personality development, has found that there is as yet a lack of definitive evidence for many of the concepts which are generally accepted. How the mother feels about breast or bottle feeding, for example, is apparently more critical than the singular impact of one or the other practice on personality. With normal youngsters she finds the type of toilet training is seldom related to broad personality variables.

Becker (1964) has formulated a complex schema just on the variants in parental discipline. The major axes are warm-hostile and restrictive-permissive.



Of course there are almost endless combinations. He points out that few parents are at the extremes and that "there are probably many routes to being a 'good parent' which vary with the personality of both parents and children and with the pressures in the environment with which one must learn to cope" (p. 202). The differences in methods and goals for boys and for girls must also be considered: We all know the same family often does not treat siblings the same way, especially if they are not of the same sex.

Teachers often make such statements as, "Well, you know *that* type of family —no wonder he doesn't study." Generalizations of this nature are more likely to be misleading than helpful unless certain qualifications are kept in mind. First of all, stereotyping a family on the basis of class, race, or any other item of information has severe limitations. If we know that you come from a middle-class family, what does that really tell us about you? We tend to assume that your family is like other middle-class families or like some mythical "average middle-class family," but actually, any two middle-class families will be miles apart on many dimensions. In fact, a given middle-class family could probably be matched with a lower-class family on some variables and an upper-class family on others. If we assign characteristics to a child simply because we have certain socioeconomic information about him in our files, we tend to create what is called a self-fulfilling prophecy. We are more than a little bit likely to elicit the behavior we expect. For example, the authors have found many examples of great concern about education among lower-class families, though it is generally assumed that the more destitute families have little interest in education and hence that their children are

low in motivation for the work of the school. It is not uncommon to hear teachers in slum schools say, in effect, that these youngsters "just don't care about getting an education." Teachers may even talk this way to a class or to particular children, suggesting that they will never get anywhere in school. Because a child is lower class, we tell him he has no interest and then we blame him for it.

There is also the frequent assumption that the affluent and upward-striving children care only for grades, and get no intrinsic gratification for learning. Thus teachers in upper-class suburbs may assume that their pupils are not interested in learning as such, but only in the "money substitute," grades. This may seem absurd, but it is the practice of all too many researchers as well as teachers to assign characteristics to a child on the basis of what is "average" for his family's socioeconomic level.

What research findings do for the teacher is to present possible hypotheses for consideration in the case of any individual child. It is like a weather prediction; you can indicate the average rainfall for the month of June, but you cannot predict whether or not it will rain on Commencement Day next year. Within these limitations we can examine certain generalizations about family patterns which at least alert the teacher to possibilities.

Clausen and Williams (1965) have reviewed the salient literature and point out that, regardless of social status, parents stress those things which will help their children to eventual success—but conceptions of success may differ. This is vital for teachers: it is not our part to imply that lower-class parents care less. Caring or not caring for children is not a matter of socioeconomic class. But parents of different classes may consider a different set of characteristics desirable for their child's role in life as they envision it. For example, many middle-class parents place a heavier emphasis on internalized self-control, intent, and motives for behavior, while many working-class parents are more concerned about the behavior itself and its consequences. Inevitably then, their methods will vary. The methods of enforcement uncovered by Bronfenbrenner (1961) show more physical punishment in the working-class families and more reasoning and appeals to guilt or to love relationships in the middle class—although the divergence is less apparent in recent studies than it used to be. Some of the controls enforced in either case will be deliberate and direct, while others will be so generalized and unspecific that those who use them are unaware of it.

We must be careful about relying too heavily on generalizations about class-related behavior. Suppose we knew that the correlation between socioeconomic level and the use of physical punishment was $+0.30$ and significant. We would still have to face the fact that this correlation accounts for less than 10 per cent of the variance. So the assumption that any particular lower-class child would respond only to physical punishment might serve as an excuse for whipping him, but it would not be valid.

In general, family roles are less defined in the middle class, and fathers are more companions and authorities; lower-class fathers are expected to impose restraints. Apparently middle-class families tend to be more permissive toward the young child and working-class families more permissive toward the adolescent. Again, it is not concern or involvement that differs but how the parents express their concern. One should not confuse class differences per se with distorted families. It is easy to recall some traumatic experience with a lower-class

alcoholic father—or, for that matter, with a suburban alcoholic mother. But these are problem families rather than representative families.

It seems evident that a homogenization of the classes is taking place, probably as a consequence of social mobility, public education, and the mass media. At any rate, individual variations among families of the same socioeconomic level will have to be recognized by any teacher wherever he teaches. To think that all children of the upper class will respond to motivational appeals based on preparation for college is just as absurd as assuming that a working-class group is incapable of learning for the sake of learning.

THE SPECIAL HAZARDS OF DEPRIVATION

In the strict sense of the term, deprivation can happen anywhere. Children in any social stratum may grow up in families which deprive them of love, of models, and of hope, but the loading for the poor child is likely to be much greater. Although there are children who grow up in the slums highly motivated for school, with a high moral code, well adjusted, and with a secure self-image, poverty severely limits the odds that this will take place. This has become a prime concern of the nation: In a democratic society we cannot afford to deprive any child, white or Negro, of his birthright.

We know, first off, that poverty reduces the chance for medical care and for an adequate diet. Disease, death, and desperation are closer at hand, as those engaged in the Head Start program have discovered. The property rights of others are less sacred when one has had little property of one's own. There is less incentive to prepare for a rainy day when it is raining already. It is well to remember that poverty is a relative thing. When you have very little and others you see have much, you are poor, even though in absolute terms you may be better off than "the poor" of other times or places.²

The obvious effects of inadequate clothes, food, and housing are not the only ones. These things influence the way you feel about yourself as well as the way others treat you. A teacher may reprimand a child for being so dirty he is odorous without realizing that the family has no bathroom and no hot water, and very little heat in winter. What can the school do in cases like this? It is very hard to give out secondhand clothes or even lunch money without teaching the pupil something you don't want to teach along with the gift.

If the school is to enter into areas of life it previously overlooked, new approaches become essential. One school opened the showers before school, and had breakfast available. The youngsters were given jobs by which they could earn credit for the food and clothing they received. For the older ones, a wider program of work opportunities helped teach resourcefulness as well as fill stomachs. And loyalty to the school increased in the process. The less fortunate do not have to value school less. But too often they find its goals inaccessible, its demands impossible, and its rewards intangible—and they just give up. So every teacher of the deprived must face the question: How does one build hope into the curriculum?

²Michael Harrington (*The Other America—Poverty in the U.S.*, New York: Macmillan, 1962) has an arresting discussion of this, and we can see all about us the consequences, which may run the gamut from apathy to activism.

Deprived children often score lower on intelligence tests, and as the school years pass, they fall further and further behind in achievement. While it is true that IQ tests are not culture free, it is also true that many of these children have had less intellectual stimulation of all sorts. They receive less attention at home; arbitrary rules are laid down and there is no room for discussion. Physical punishment may be used, and may be the only control device effective with some until we teach them otherwise. Their language is expressive, but incomplete in syntax and not the type the teacher uses. They have missed many experiences which are precursors to school tasks—manipulative toys, exploration, cutting, coloring, pasting, being read to, and being taken places. The result is not always the same; in some it is impulsivity on the loose, in others a reticence to explore the new and forbidding world they encounter at school.

Both biological and experiential factors limit the child's ability to cope with school as it is typically presented. Sometimes the experiential deprivation is severe. Methods and content must be altered to fill in the gaps for those who first reach school at six, and compensatory programs such as Head Start have been designed to begin making up for environmental deficiencies as early as possible. But it is becoming clear that Head Start is really a late start, and that similar enrichment will be needed all through school. A booster shot is not enough.

Thus it is that preschool activity centers have ceased to be merely "day-care centers" or "play schools" and become institutions with prime significance in the educational hierarchy. For the fortunate child they serve as an extension of the home. For the deprived child they serve as a profound influence to provide what is missing from the home. There are several areas of development where competency can be stimulated so that school can be mastered more adequately at a later date.³ There is of course the matter of socialization, learning patterns of group conformity from taking turns at play to sitting still while a story is being read. There is the cultivation of motivation, the very desire to learn. There is the stimulation of curiosity and exploration of the environment, with planned excursions and many direct sensory experiences such as contacts with objects of various colors, shapes, and sizes. There is the awareness of oneself as a discrete being with an identity and worth in the eyes of adults. And there is language, the cultivation of symbolic representation which is the major channel for later accomplishment. Thus preschool education is no longer a time of waiting or of play alone: it is a time of awakening, of stimulation, of pattern setting. As we shall see, psychological theorists and experimenters are increasing their efforts to provide the teacher with an increased understanding of what has come to be recognized as the golden age. If Omar K. Moore can teach three-year-olds to read and type, are we not obliged to be aware of the potentials of this age? Perhaps we have always been aware of the importance of infancy and early childhood—but we are no longer sanguine about leaving it to chance, and though much be without formal instruction, we cannot afford to leave it to naïve supervision.

A final note concerns the importance of the preschool period in programs of special education. Programs for the seriously disturbed are starting earlier and

³The literature on this topic is growing by leaps and bounds. One good volume is L. D. Crow, W. I. Murray, and H. H. Smythe, *Educating the Culturally Disadvantaged Child* (New York: David McKay, 1966). Another is M. D. Usdan and F. Bertolaet, *Teachers for the Disadvantaged* (Chicago: Follett, 1966).



Perhaps the greatest value of Head Start and other preschool programs lies in the fact that they help to "fill in the gaps" in the backgrounds of children from impoverished environments. Many children in such programs have never before had the opportunity to handle a telephone or care for a growing plant.

earlier. Work with the blind and mentally handicapped cannot wait until the normal school age without the possibility of much unsystematic learning which has later to be undone.

WHAT CAN WE CONTROL?

The school can do nothing about the heredity of the children it enrolls. Thus, as a teacher, all your eggs are in one basket. If you are to guide and control children's development, it must be through control of their environment. So it is vitally important for you to know the extent to which development *can* be directed and controlled by control of environment. How much variability is possible within the limits set by heredity?

Psychologists can hardly afford to deprive children of normal experiences in order to test hypotheses about the effects of different environmental conditions. But we can piece together many bits of evidence gleaned from several sources such as studies of twins reared apart, clinical records of children whose early environments were unfavorable, experiments with temporary sensory deprivation, and studies of the effects of deprivation on young animals.

Twins reared apart

Identical twins have identical heredity. Thus when identical twins reared in different environments develop quite differently, we can assume that the differences have resulted from their different opportunities and experiences and are thus to some extent subject to our control—at least theoretically. But two points should be made clear. First, we are not saying that the different environments have *caused* the different traits but only that when the same heredity is combined with different environments, different sets of traits appear. Though heredity has been “held constant,” it has not ceased to exert its influence. Second, heredity and environment do not exert their influence in a mechanistic way. There is always the personal stamp of the developing personality to consider. Increasingly, as a child grows older, his response to environmental stimulation and to his own potentialities involves selection and evaluation on his part. One of the marks of maturity is that the individual is not “stimulus-bound”: his behavior is in keeping with his own long-term standards and values instead of being determined by the stimulation of the moment.

The best-known study of twins reared apart is that reported by Newman (1940) comparing the life histories of twenty sets of twins. These twins were believed to be identical, though in some cases it was impossible to be certain.

It was found that whenever the educational experiences of a pair of twins differed to a marked extent the twin with the greater amount of education had a distinctly higher score on all ability and scholastic achievement tests, while in those cases where there was no difference in education, or only a small difference, the scores of the twins of a pair tended to be about as similar as the average of one-egg twins reared together.

Twins reared apart were, on the average, alike in physical characteristics except for weight. In mental capacity those reared together averaged 5.3 points difference in IQ while those reared apart averaged 8.2 points difference. Scholastic achievement test differences averaged more than twice as great for twins reared apart as for those reared together. Differences in personality traits were greater than differences in the other traits measured. Other twin studies, carried to old age, have demonstrated that identical twins are more alike than fraternal twins, even after sixty years of life (Kallmann and Sander, 1949).

Isolation and sensory deprivation

Whether taught or untaught, a child learns through responding to stimulation of some sort. Without a continuing interchange with the environment, even the best hereditary potential could not develop. The dramatic effects of an almost complete lack of such interchange for a child's first five years are shown in the following case reported by Davis (1947).

A child, Anna, five years old, was found tied to an old chair in a secluded room. After being shifted about from place to place for the first half-year of life, she had

been kept there for several years because she was a second illegitimate child and as such was an unbearable object to her grandfather. When found, she was unable to move or talk. Her leg muscles had atrophied to the point that her flaccid feet fell forward. She was believed deaf and blind, for she showed no response to auditory or visual stimuli. Physically, she was malnourished but not diseased.

Remarkable changes accompanied a change of environment. In three days she was able to remain in a sitting position and could move her arms and hands. She had been massaged and given a high-vitamin diet and plenty of attention. Later she would turn her head slowly to listen to a clock held near her or to look at a suddenly opened door. Still she appeared deaf to speech or hand clapping — human sounds. Yet her reflexes were normal. She neither smiled nor cried and was almost expressionless. There was no play in her repertoire. Later she began to smile if coaxed and showed temper if physically restrained.

Records revealed that as a baby she had appeared normal, indeed attractive. The matter of hereditary endowment is open to question for the mother was dull mentally, and there was doubt as to the father's identity.

Ten days after the first visit, the examiners found the child more alert and able to fix her attention. She showed taste and visual discrimination, smiled more often, and began to accumulate ritualistic motions with her hands and a series of personal tricks such as any infant performs.

Almost two months after being found Anna ceased to improve. The effects of environmental manipulation seemed to have worn off. In nine months she had learned little. She could not chew or drink from a glass or control her bodily processes, and she could barely stand when holding on to some support.

At this time Anna was placed in a foster home where she received the constant, warm concern of a foster mother. In a month she had learned to eat, grasp a glass, and feed herself. She showed excitability. Improvement continued until she understood many instructions and babbled, although she could not use words. Her initiative was low. Motor ability had increased. Again she seemed to hit a plateau and was put in a home for retarded children.

Five years after she was found, she was speaking about as a two-year-old — eight years retarded for her chronological age. She was socialized, used a spoon, conformed to toilet habits, loved her dolls, and had begun to speak a few sentences. She died shortly thereafter at the estimated age of ten and one half.

One can see in this little girl's development the sequential nature of growth and the need for careful nurture that she never received. Without environmental stimulation in her earliest years, she did not mature into a real human being.

There are a few similar cases, such as the one reported by Mason (1942) of a girl who had been kept in a dark room by a deaf-mute mother. She was believed wholly uneducable, but she too went through the usual developmental stages, making six years' progress in two years. By the time she was fourteen, she was able to get along fairly well in the sixth grade.

Like our need for air, our need for stimulation does not make itself felt until it is denied. But we are so seldom without an adequate level of stimulation that psychologists have not fully realized until recently how dependent on it we are for normal development and even sanity. Hebb (1958), working with dogs and other animals, deprived them at an early age of normal sensory stimulation and any chance to explore their social or physical environment. As adults, the animals

were devoid of curiosity, poor at making discriminations, and low in learning ability. Even when they were later given ample stimulation and opportunity to explore and to socialize, they never overcame the handicap of their early deprivation.

It is a seductive jump to apply these findings to children, making the assumption that a child from a nonstimulating early environment is going to be a poor learner in school. The wondering that makes learning gratifying seems lacking in many pupils, but is this because of early deprivation? And is it nonreversible? We do not yet know the answers, but we can conjecture that when a pupil is hard to activate, his lack of response may indicate a serious inability rather than willful resistance.

It is not only the child who has been deprived of adequate sensory stimuli who is unresponsive, however. A child brought up in "normal" surroundings with the constant admonition "Don't touch!" or "Leave that alone!" may come to school afraid of initiating any contact with the environment.

All of us, children and adults alike, need a certain level and heterogeneity of stimulation not only for normal development but also for a continuing verification of our assumptions about the world and for "feedback" regarding our position and behavior. Perhaps you have played the game of standing immobile with your eyes shut and trying to keep from falling. Without tactual or visual "support" it is almost impossible to keep your balance for very long.

In another approach to studying the need for adequate stimulation, adults have been almost entirely cut off from stimulation for many hours at a time. The subjects' ability to make useful responses diminished, and in several cases hallucinations and behavior resembling psychosis occurred. The subjects also reported an increasing "hunger" for stimulation which in some cases reached an intensity verging on panic. In fact, the experience was so harrowing and disagreeable that none of the subjects chose to remain more than a few days, even for a remuneration of \$20 a day. Interestingly enough, there was the greatest temporary decrement in intellectual processes where stimulation was not *lacking* but was of an amorphous, unstructurable character—a soft, constant buzzing sound, and soft light seen through translucent goggles. Thus it may be that heterogeneity of stimulation is as important a factor as actual amount. Bruner (1959) sums up the effects of sensory deprivation on development and everyday functioning as follows:

I have suggested that early sensory deprivation prevents the formation of adequate models and strategies for dealing with the environment and that later sensory deprivation in normal adults disrupts the vital evaluation process by which one constantly monitors and corrects the models and strategies one has learned to employ in dealing with the environment. (p. 95)

DEVELOPMENTAL PROCESSES BEFORE SCHOOL

The development of the infant's limited behavior repertoire into that of the talking, walking, active preschooler is the first wonder of the world. Particular elements of the environment have come to call forth differentiated responses, and the child has favorite toys, preferences for certain foods, and a recognition of what

sorts of behavior are likely to bring punishment. Spatial organization of eye, hand, and mouth has been consolidated (Bruner, Olver, and Greenfield, 1966).

In the year-old child, the rhythm of sleeping and waking has become established, the child has six or eight teeth, and soft foods have been added to his diet of milk. He may even be able to say a word or two. Social responses to those he knows and also to strangers become apparent, and he can make his feelings known. He can often be moved from crying to cooing—or vice versa—by those about him. Everything within range is touched, grasped, and probably mouthed. He can pick up small objects and pound with some force. He can stand but probably not walk alone. (Of course, the range of individual differences will be considerable.)

By the end of the second year, the baby has learned to walk. He is beginning to talk, though he understands more than he can express. The toilet training so important in our culture has probably been started. How this is done and how he responds will be significant in formulating his attitudes about his parents and himself. His feelings of being loved and secure and successful will reflect this to a considerable degree. And he gets into everything within reach, which brings danger to himself and frustration to his family, calling forth prohibitions and at times punishment. If he is treated harshly or impatiently or if the demands upon him are more than he can manage, he may well become fearful and insecure.

By the end of the third year, the child has formulated a fairly stable self-concept. He is assuming the appropriate sex role,⁴ and he sees himself as good or bad, plain or attractive, clumsy or capable. His need for autonomy is expressed in the negativism with which he often tests his power. He needs elbow room for self-determination, even though conformity in many areas must be required. While there are great individual differences, talking is more or less continuous and he has a vocabulary of about 900 words. Imaginative play is common, curiosity is high, and there is a good retention for experiences which have personal significance. By this time the social group has some meaning, and he is stimulated by watching his peers. He has learned so much in handling his body, speech, concepts, and social relationships that babyhood is left behind. There was a time when this period and even the next two years were more or less exclusively the province of the home, but this is no longer the case. Extension of schooling downward from the first grade and kindergarten to the nursery school is an evident trend. It has been accelerated by the federal support and emphasis on preschool programs to compensate for the deprivation of underprivileged homes.

Both current research and reevaluation of once-discarded theories are contributing to "new" preschool education programs. We have already mentioned the growing concern over the frequency of deficits in language, thinking, and attentiveness. There has also been a resurgence of interest in Montessori methods and early formal training. The net result is that, in addition to the extensive play, listening to stories, and singing which once constituted the major emphasis in nursery schools, special efforts are being made to help the children establish their identity, sharpen their perceptual skills, and increase their language ability, and to stimulate imagination and creativity.

⁴The most extensive experimental study of the process of identification to date provides insight regarding the complexity of personality formulation. See R. L. Sears, L. Rau, and R. Alpert, *Identification and Child Rearing* (Stanford, Cal.: Stanford University Press, 1967).

Since the development of methods for teaching preschoolers to read, there has been a veritable explosion of plans to "start them early." Psychologists are of two opinions regarding this. On the one hand, there is obviously more potential for formal learning than has been supposed. But this accelerated teaching requires extensive technology and time. And what are the long-term effects of replacing free play and exploration with a formalized, "hurry-up" curriculum? Parental expectations are already a problem; to have four-year-olds being pushed to read may do more harm than good. What we can say with certainty is that preschool programs are deficient if they do not pay more attention to specific areas of need. This is particularly true, as we have seen, in the case of the less fortunate youngster. Without early and continued assistance, he will not be able to compete, no matter what his potential.

Through the fourth and fifth years play is still a major channel for exploring, practicing, and consolidating new knowledge. Play-acting the family roles is prevalent. Not only are building blocks needed for large muscle activity, but swings, slides, and climbing equipment challenge and excite. Toys should be things that can be manipulated. Talking has become a way of life and chants and word play are common. Small animals and pets are much beloved. Noise is good and playmates are fun. While his attention span for adult demands may be short, the child can concentrate longer on things of interest to him. His coordination is still gross, as shown in his use of crayons and paints.

His personality style has become more evident. He still needs love and acceptance as well as understanding control. Life is a series of episodes, tears and laughter, fatigue and energy release. The child before school is obviously not a "finished" model. But there are many processes which become established in these years; to summarize:

1. He begins to organize his experiences, and finds patterns which give meaning to the variety of stimuli about him. In other words, his intellectual processes begin to be formulated. He begins to use language of symbolic expression and concept formation. He is finding out what the physical world is like and ordering the results of the search.

2. He comes to have expectations in regard to the social beings about him. Can they be trusted? Will they take care of him? Can they be depended upon? Are they to be feared or loved? The social world, like the physical world, is beginning to take on a pattern. He comes to have definite ideas about himself. He knows he is a "good boy" or a "bad boy." He is aware of his worth—or lack of it—in the eyes of those around him. He learns to expect either success or failure in his efforts to cope with life. He acquires certain attitudes about achievement and values. He is learning what types of behavior are relevant to his sex role, and this factor is coming to have more and more influence on his behavior. His inner life is being formulated.

THEORIES OF DEVELOPMENT

Psychologists have given a good deal of attention to patterns of development in childhood. A number of theories concerning the various aspects of children's

growth have been formulated, and we shall now turn our attention to four of these that represent somewhat different approaches.

Olson's organismic age concept

An investigator whose work merits the attention of anyone interested in teaching is Willard C. Olson. Olson and his associates have developed a technique involving the "longitudinal" method of studying growth: the *same* children are examined at intervals from early childhood to adolescence, measurements are taken, and the results are plotted to describe their individual patterns of growth and development.⁵

Growth factors measured are height, weight, dentition (as measured by the eruption of the permanent teeth), skeletal development (as measured by X rays of the wrist bones); muscular development (as measured by strength of grip), mental development (as measured by individual tests of mental ability), and school achievement (as measured by standard school achievement tests). These are converted to age equivalents by means of tables of "normal" development which have been constructed by averaging the measurements of large numbers of children.

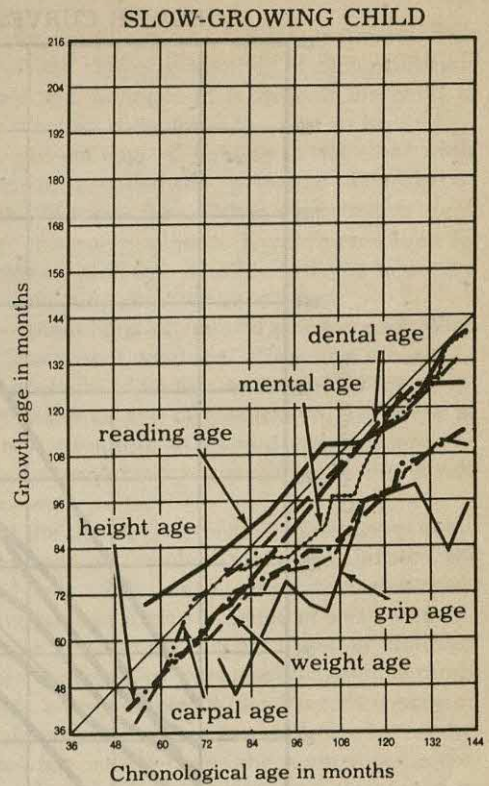
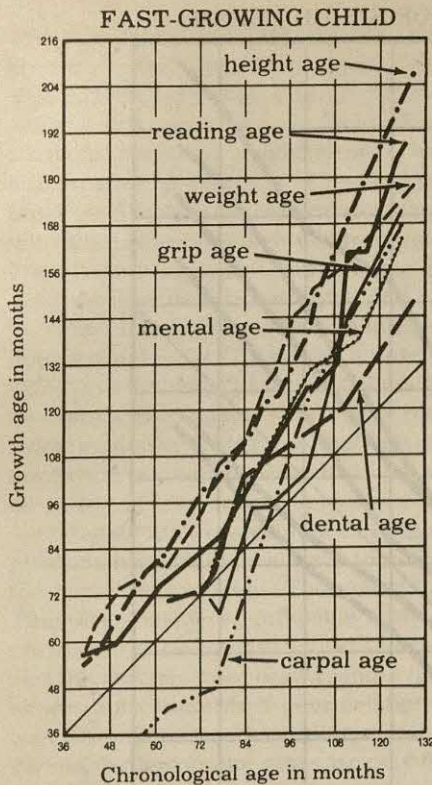
The graphs opposite show how Olson's technique is used to plot curves of growth for children. They also demonstrate two typical patterns of development. The base line of the graph shows chronological age, and the vertical axis represents growth age. For easier reference, a straight diagonal line is drawn through the points at which chronological and growth ages are the same. The child's "ages" in the seven different aspects of growth for a given year are located on the graph, and as the data are collected and plotted year after year, the points are connected to form curves for growth in reading, height, weight, and all the other growth factors involved in the study (Olson, 1950).

It should be noted that most of Olson's measures are of *physical* development. Emotional and social development are not measured as completely. However, since the school achievement ages correlate highly with the physical measures, Olson makes the hypothesis that *all* aspects of a child's development are highly correlated with each other. By averaging all the various measures he gets what he calls the child's organismic age — his overall developmental age.

The graph on page 78 shows organismic age curves for six children, covering nearly six years of development. It will be readily apparent that the curves vary considerably but that the growth pattern of any one child shows stability over the years. Thus it becomes possible to look ahead and see what his growth probably will be by extending the pattern at the same progression.

In terms of the schoolroom, Olson stresses the importance of accepting each child where he is, rather than judging him on the basis of where we think he ought to be. No amount of instruction can teach a child what he is not mature enough to learn. Attempts to force a slow-growing child into higher achievement than he is ready for will result in failure. Instruction geared to his present readi-

⁵Olson explains his organismic age concept in Chapter 7 of his *Child Development* (Boston: Heath, 1959).



(after Olson and Hughes, 1944)

ness level will avoid the frustration and harm that can come from attempts to force him.

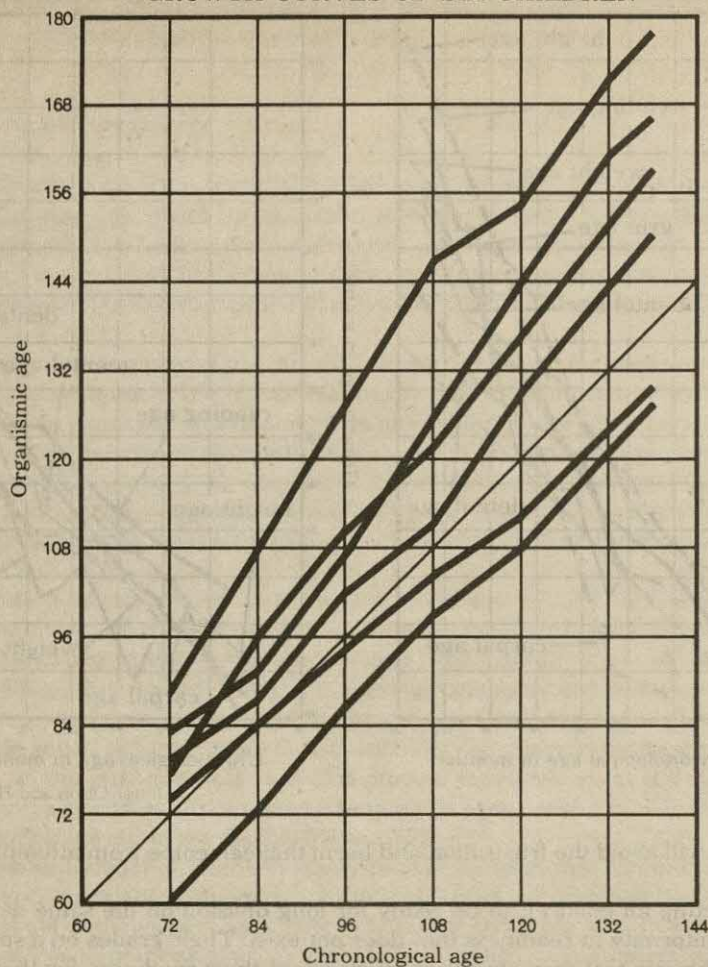
Expecting all children to be ready for long division on the same day presupposes a uniformity in readiness that does not exist. Their grades on a spelling test or an arithmetic test may reveal as much about their readiness for that material as it does about their achievement. Olson argues eloquently for *pacing* in the classroom—letting each child move ahead at his own rate with materials suited to *his* achievement level. The elimination of formal grades on report cards and flexibility in curriculum planning are examples of the techniques used by many schools in line with Olson's thinking.⁶

Piaget and the Geneva School

The approach of the Swiss psychologist Jean Piaget and the "Geneva School" is both theoretical and experimental. Piaget's work is based on extensive observa-

⁶W. C. Olson presents research data to indicate that achievement tends to follow development rather than teaching pressure in his article, "Achievement as Development" (*International Review of Education*, 1957, 3, 135–142).

GROWTH CURVES OF SIX CHILDREN



(after Olson and Hughes, 1944)

tion of individual children. The subject matter of his investigations ranges from the intellectual to the moral sphere.

Piaget sees the first two years as the sensorimotor phase. Here the task is to coordinate motor actions and perceptions, moving from reflex behavior to deliberate, and eventually demand-satisfying, activity. The child is gradually putting together a picture of the world around him. From two to the end of the elementary-school years, conceptual processes are developing, though not at a uniform rate for all children.

One of the most fascinating aspects of Piaget's work is his experimental study of intellectual development (Piaget, 1926).⁷ To study the development of concepts

⁷Six of Piaget's essays on intellectual development have been published together in English for the first time under the title *Six Psychological Studies* (New York: Random House, 1967).

of weight, shape, and volume, for example, he cut up a ball of clay or changed its shape; poured liquid from a container of one shape to another of quite different shape. He found that, until about school age, changes in form lead the child to assume changes in weight, volume, or amount. Amount is the first to be understood as constant, weight is next, and the concept of volume is not clear until adolescence. Awareness of these constancies is called the "principle of conservation," and it follows general developmental sequences. Other experiments deal with the bases on which children group or arrange objects. Experiments such as Piaget's are generally interesting to children; students who have access to young children may wish to try their hand at replicating some of his studies.

Piaget has also studied children's explanations of natural phenomena. Why does a cloud move? "Because it does." "Because it wants to." "Because it has to." "Because the wind pushes it." Such progression of understanding of the external environment is believed to follow roughly the course of maturation, but there is some evidence to suggest that this is not inevitable. A limited environment reduces the sequence. How much it can be expedited by specific tutoring is not clear, but at least rough limits seem to be set by age.

Piaget (1932) has evidence to support the theory that morality is an age-related phenomenon, though it may to some extent be accelerated or decelerated by the social environment. The young child sees adult rules as absolute and sacred. They are considered inflexible and universal. As a consequence of social experiences, the child comes to a sense of justice through his respect for other children and the reciprocity of relationships. These concepts are considered to evolve more or less autonomously if peer relationships are available. While Piaget's theory of cognitive aspects undergirding moral judgments has been generally accepted, the inevitable democratic ethos he postulates has not. Perhaps the main value is the recognition of how external punishment as a major determinant gives way to more complex conceptual regulation as the child grows.

When childhood ends and adolescence appears, the progression merges into cognitive thought which relies on symbolic expression. Problems are more systematically approached and hypotheses are used. Through the ability to reason, youth understands his world and his place within it. New values are worked out and egocentricity is replaced by a general sense of justice. Thus development proceeds toward mature cognitive behavior and total integration. It is clear that some individuals never reach a high level of integration.

Jerome Bruner has devoted considerable attention to the application of Piaget's work to educational problems. He has thought in terms of a whole curriculum based on the sequences in cognitive development (Bruner, 1966), and we shall be looking into this matter. The implication of such a progression suggests two considerations. First, the necessary interaction with the environment must be provided if development is to take place. Second, specific encouragement may facilitate progress at the stage when the child is able to move ahead. For example, one might foster rational thinking by providing experiences in ordering and classifying objects. On the other hand, trying to teach "causality" other than by experience or before the child has acquired the necessary background would be wasted effort. Piaget is not interested in naming dissociated verbalisms, as he points out when he says children can count before they have any number sense.

Havighurst's developmental task concept

A third approach to the problem of growth and development has been evolved by Robert Havighurst in connection with his work on the Committee on Human Development at the University of Chicago. At each life period, he points out, people are confronted by certain *developmental tasks*—skills, attitudes, understandings—that they need to achieve and are expected to achieve. These tasks are created by the individual's maturing physical and mental capacities, the cultural forces around him, and his own personal values, motives, and aspirations. Learning to walk and to talk, for example, are based on physical and mental readiness, parental expectations, and the child's own growing urge to get about more and communicate with others.

Havighurst divides the life span into six periods and defines the tasks of each period, in our culture, as shown in the chart on the next page.*

Havighurst emphasizes the necessity for meeting the tasks of one period in order to have the prerequisites for meeting the tasks of the next period. For example, some of the developmental tasks of adolescence are to develop new relations with age-mates of both sexes; to learn to look upon girls as women and boys as men; to become an adult among adults. These tasks arise out of physical pressures, cultural pressures, and personal pressures, and their successful accomplishment means a reasonable assurance of good social adjustment throughout adult life. Failure to meet the tasks of childhood means that later social adjustment may be inadequate and unhappy, for the individual will be ill-equipped to meet the tasks that adulthood brings.

The implication of the developmental task concept for educators is, again, awareness of the child as a whole child, not just a conglomeration of independent needs, abilities, skills, and impulses. It becomes the school's obligation to provide a situation in which youngsters can be successful in meeting the appropriate developmental tasks. Success at their present level is the best assurance that they will be able to succeed at later levels.

The psychoanalytic approach

Clinical work with emotionally disturbed people has led to still another approach to the problem of growth and development. Even here several distinct schools have evolved. The classical one is the psychoanalytic, growing out of the teachings of Freud. Since Freudian theory is too complex to describe fully here, we shall mention only certain key concepts bearing on child development.

According to Freudian theory the human infant is like a young animal, following only the pleasure-pain principle to gain all the pleasure and avoid all the pain that he can. His personality is primitive and largely unconscious, consisting of instinctual impulses called the *id*.

As he develops, he begins to recognize and apply the reality principle, weighing and accepting present pain in the interests of greater pleasure later. He also develops a sense of self or *ego* which helps him to integrate and modify his im-

*The task concept and its meaning for educators are discussed by Havighurst in *Human Development and Education* (New York: Longmans, 1953).

DEVELOPMENTAL TASKS FROM INFANCY THROUGH LATER LIFE

Infancy and early childhood (birth to 6 years)	Middle childhood (6–12 years)	Preadolescence and adolescence (12–18 years)
Learning to walk. Learning to take solid foods. Learning to talk. Learning to control the elimination of body wastes. Learning sex differences and sexual modesty. Achieving physiological stability. Forming simple concepts of social and physical reality. Learning to relate oneself emotionally to parents, siblings, and other people. Learning to distinguish right and wrong and developing a conscience.	Learning physical skills necessary for ordinary games. Building wholesome attitudes toward oneself as a growing organism. Learning to get along with age-mates. Learning an appropriate masculine or feminine social role. Developing fundamental skills in reading, writing, and calculating. Developing concepts necessary for everyday living. Developing conscience, morality, and a scale of values. Achieving personal independence. Developing attitudes toward social groups and institutions.	Achieving new and more mature relations with age-mates of both sexes. Achieving a masculine or feminine social role. Accepting one's physique and using the body effectively. Achieving emotional independence of parents and other adults. Achieving assurance of economic independence. Selecting and preparing for an occupation. Preparing for marriage and family life. Developing intellectual skills and concepts necessary for civic competence. Desiring and achieving socially responsible behavior. Acquiring a set of values and an ethical system as a guide to behavior.
Early adulthood (18–35 years)	Middle age (35–60 years)	Later life (60–)
Selecting a mate. Learning to live with a marriage partner. Starting a family. Rearing children. Managing a home. Getting started in an occupation. Taking on civic responsibility. Finding a congenial social group.	Achieving adult, civic, and social responsibility. Establishing and maintaining an economic standard of living. Assisting teen-age children to become responsible and happy adults. Developing adult leisure-time activities. Relating oneself to one's spouse as a person. Learning to accept and adjust to the physiological changes of middle age. Adjusting to aging parents.	Adjusting to decreasing physical strength. Adjusting to retirement and reduced income. Adjusting to death of spouse. Establishing an explicit affiliation with one's age group. Meeting social and civic obligations. Establishing satisfactory living arrangements.

pulses. Later he develops a conscience or *superego* consisting of codes of right and wrong that he learns from his social group and *internalizes* as a sort of inner policeman.

Psychoanalysts feel that personality disorders in adulthood can almost always be traced to events of infancy and early childhood. These may be either traumatic experiences, perhaps long since forgotten, or failure to progress normally through

certain stages of psychosexual development. For example, the first three stages, according to the Freudians, are as follows,

1. The *oral* stage, in which the infant's greatest source of gratification is sucking. This is thought to be the prototype of all his *receiving* relationships in later life. If thwarted or inadequately satisfied, he may become impatient, restless, perhaps argumentative and vitriolic. Excessive eating in adulthood, especially of sweets, is regarded as an extreme case of oral gratification sought because the individual did not receive adequate gratification as an infant. Even general traits like optimism or dependence are thought to be related to an individual's experiences during this period.

2. The *anal* period. Urinating and defecating are regarded by the Freudians as the prototype of a child's *giving* relationships. Not only are they interesting to a child in themselves but they give him a new sense of power both of creation and of thwarting overdemanding parents. Adult traits of perseverance, orderliness, conscientiousness, stinginess, and stubbornness are thought to be related to experiences during the anal period.

3. The *genital* period. In his third year the child becomes aware of himself as a boy or a girl and notices differences between brothers and sisters and between his parents. If his natural curiosity and handling of his genitals are treated as "naughty" or "dirty" he may develop an attitude toward sex that can severely hamper his normal sexual development.

Psychoanalysts believe that with the recognition of sex differences a child runs into a conflict in relating to his parents as a man and a woman. A boy, they feel, wants all his mother's love and regards his father as a rival until he learns to identify with his father. By accepting the role of masculinity he solves his problem and his father becomes his ally rather than his competitor. A little girl goes through the same conflict with her mother. Where those conflicts are not solved and the basic identification with one's sex is not made, groundwork is laid for later trouble.

Psychoanalytic writers since Freud have placed greater influence on socio-cultural pressures in shaping development both during early childhood and later on. But the psychosexual stages just described are accepted by psychoanalysts as basic in determining the ways in which a child will learn to obtain gratification and relate himself to his environment.⁹

One of the many modern adaptations of Freudian theory is that of Erik Erikson using the developmental task concept and incorporating both the inner growth forces and society's demands on the individual. He distinguishes eight basic conflicts or crises which come into focus at definite points in one's life and which must be resolved in a satisfactory direction and to an adequate degree for success at later points and for achievement of maturity. Success at these eight stages brings, in sequence, an adequate measure of:

1. *Trust*: the beginning of a sense of faith in self and others growing out of the expectation that the world is consistent and dependable.

2. *Autonomy*: sufficient trust in self and parents to dare to defy them but ability also to cooperate and accept their help.

⁹For a fuller summary of psychoanalytic thinking, see *Schools of Psychoanalytic Thought* by R. L. Munroe (New York: Holt, Rinehart & Winston, 1955).

3. *Initiative*: a sense of being able to direct events within the dictates of conscience without an inhibiting sense of guilt.

4. *Industry*: a sense of adequacy for social usefulness, with mastery of basic skills needed in one's society.

5. *Ego identity*: integration of childhood patterns and adolescent changes into a new, consistent, acceptable picture of who and what one is and what one's adult role is to be.

6. *Intimacy*: ability for self-abandonment in intimate relationships without fear of ego loss.

7. *Generativity*: ability for a parental kind of responsibility expressed through greater interest in giving and loving than in getting and being loved.

8. *Ego integrity*: identification with the dominant ideals of one's culture so that one can be content with his individual life cycle and see it as meaningful in history.

At each stage there are specific pitfalls, with the danger of particular inadequate resolutions of the conflict. Where the desirable resolution is not achieved, there is damaged potential for meeting the crises at later stages.¹⁰

These four approaches to child development will give you some idea of the range that you will find in observations of children and theories of how they grow. You can readily see how the method and setting selected for the study affect what will be seen and what theoretical framework will be developed.¹¹

Olson, a psychologist, comparing growth curves for different children and for different aspects of growth, found that children tend to grow "all of a piece" with some growing slowly, others more rapidly. The inevitable implication for the school situation was that in any class children would vary greatly in their readiness for new learning and in their speed of learning. Forcing them through the same activities at the same rate would be futile, and highly discouraging for the children.

Piaget has concentrated on cognitive development in children. His observations have covered a broad range of interest, from concepts of logical thinking to concepts of moral judgment. Havighurst, a sociologist, studying the entire life span against a backdrop of social and cultural expectations, has focused on the adjustments that each member of society needs to make from infancy onward.¹² The Freudians, interested in emotional development and adjustment chiefly through therapeutic work with disturbed adults, have tended to ignore other types of development and other types of factors that can also affect personality development.

¹⁰Erikson's theory is elaborated in two of his books, *Childhood and Society* (New York: Norton, 1963) and *Identity: Youth and Crisis* (New York: Norton, 1968). For a brief, readable picture of the forces in conflict at each stage and the particular hazards entailed, see the first chapter of *Personality in the Making*, the report of the Midcentury White House Conference on Children and Youth, H. L. Witmer and R. Kotinsky, Eds. (New York: Harper & Row, 1952).

¹¹For a comparative study of differing approaches to the study of development—those of Piaget, Erikson, and Robert R. Sears—see Henry W. Maier, *Three Theories of Child Development* (New York: Harper & Row, 1965).

¹²For another sociological view you will want to read *The Sociology of Child Development*, by J. H. S. Bossard and Eleanor Boll (New York: Harper & Row, 1960). The authors place chief emphasis on the social situations in which children live and grow from infancy to maturity and their effect on the development of specific behavior and values.

These are only a few of the ways in which children's development has been studied. But you can see from them how the theories that evolve in child study can both help and hinder further study. They can help by suggesting special experiments and special observation to test a hypothesis or fill in a gap. They can hinder when they become "molds" into which adults try to fit all children and when they limit what is studied and what is seen.¹³

THE TEACHER REAPS THE HARVEST

Johnny has been at home for a good many years, and he has been busy learning many ways of thinking, feeling, and behaving. He has his possessions, his family, his pals, and he has developed his own way of doing things. Finally he arrives at school, bringing with him his confidence or fearfulness, aggressiveness or timidity, and whatever level of intelligence, skill, and overall maturity he has achieved. Perhaps it is a nursery school, perhaps a kindergarten, often the first grade. In school he has a new situation to deal with, and usually it is a situation which he must accept whether he likes it or not.

Some children are eager to go to school. Others are afraid. Some are so upset by the thought of this new experience that they actually become sick. Sometimes a child is ambivalent: he wants both to go to school and to stay home. His problem would be solved if his mother could come to school or the school to his home. It may not be the actual going to school that he dislikes so much as the thought of a sister or brother at home having Mother all to himself.

On the other hand, some parents resent their child's arrival at school age, with the new life for them which that involves. No longer is their youngster little and exclusively theirs. And—a frightening thought—here is visible evidence that they themselves are getting no younger.

So the transition from home to school may not be easy. But any major transition takes time and patience. Fortunately, most children start out liking school.

Much of a child's attitude toward school depends upon the teacher. She is the mother substitute. If the child's relations with his mother have been adequate and if the teacher is understanding, the transition need not be too difficult. Should there be overdependence on the mother, however, or hostility toward her, this may be transferred to the teacher. Teachers need to be aware of this and attempt to meet each child's needs as they become apparent. Unless he has been severely mistreated, a child will usually respond readily to a healthy school situation.¹⁴

The teacher helps the child with his personal relations, his formal learning, and his boots. Hence she has a tremendous power for help or hindrance of phys-

¹³A synthesis in which various problem areas rather than points of view are emphasized is the difficult but authoritative book by P. H. Mussen, *Handbook of Research Methods in Child Development* (New York: Wiley, 1960). Research methodology and findings are synthesized for biological factors, cognitive factors, and personality and social factors. A basic book on the dynamics of personality growth and patterning, stressing the active role the organism takes in its own development is *Pattern and Growth in Personality* by G. W. Allport (New York: Holt, Rinehart & Winston, 1961). The methodology and special promise of the longitudinal method are elaborated by H. E. Jones in "The Longitudinal Method in the Study of Personality" in *Personality Development in Children* (Austin: University of Texas Press, 1960).

¹⁴An excellent discussion of children's needs is contained in *Helping Children Reach Their Potential* by G. G. Jenkins (Glenview, Ill.: Scott, Foresman, 1961).

ical, mental, emotional, and social growth. She can make a child feel inadequate or capable, clever or stupid. He really is not very sure about himself yet and accepts her evaluation. Frequently, behavior problems are a normal response to an unhealthy situation at school. The teacher may establish an atmosphere in which the child learns unwholesome reactions to life.

Teachers spend a great deal of time trying to get children to behave in certain ways, exhibit certain values, develop certain perceptions and understandings. This is their job. They need to be on guard against setting goals for a child in terms of their own unconscious wishes and needs. It is easier to try to mold him according to their own concepts and to value him in proportion as he conforms to their values than it is to let him do his own growing and to help him in terms of what he needs.

The new authority of the teacher can mean another problem for the child unless parent and teacher agree. "Mother says" and "Teacher says" can become the order of the day. Clever children can learn to play one against the other to gain their own objectives.

At school there are many "siblings"—a whole room full of "brothers" and "sisters." The teacher must be shared. If there is not enough of "her" and too many of "them," it is difficult for the individual child to feel accepted.

Status problems begin, with strains and stresses for friends, toys, and leadership. There is the threat of open competition, soon apparent in learning situations. How will the child adjust to these situations? What personal risks does he see in them? Groups the child knew before school were fluid and flexible. When the going was tough or when he had had enough, he could always go home. Once in a while a kindergarten child will do just that—go home.

Most children feel the restraints of the school situation. There are clocks, teachers, and doors. They present barriers to freedom. The child no longer is master of his time and energy. In school he must behave as others do and conform to schedules and regulations made for the group instead of for him alone.

Fortunately, for most children the advantages of school far outweigh its disadvantages. School is fun and exciting. The teacher has a never-ending flow of ideas, songs, and games. There are new friends, new things to do. Most children welcome the challenge to their abilities.

The spontaneity of young children, their budding social awareness, and their creativity can make a kindergarten or first-grade room an exciting place for the teacher. Perhaps at no level will she wield so much influence by even the little things that she does. The world she creates in her classroom represents "the outside world" to the children. It is their first experience in living in this outside world, and the ways they learn and the feelings they have about it will carry over into other experiences with the world beyond the school.

How important is teaching?

More practical for the teacher than assigning relative weights to nature and nurture is knowing what learning will "come naturally" to most children through the normal experiences of living and what will need specific teaching. And in between, what learnings that might be achieved by many children outside of

school can be more efficiently and more surely achieved through teaching in school.

This is no academic problem. From many sources comes evidence to challenge our assumptions of what teaching contributes to achievement in school and to point up the importance of both growth and incidental learning in the total equation. Most people would expect more learning to accrue from two science courses than from one, yet one study showed that after a time lapse the amount of factual information students had was about the same if they had had one course as if they had had two. Likewise, it has been widely assumed that the more practice, the more learning, yet in one early study of 30,000 school children, it was found that those who had drilled ten minutes a day on spelling showed the same spelling ability as those who had drilled fifty minutes a day (Mursell, 1946).

English schools have a reputation for drilling more rigorously on "fundamentals" than American schools, and they introduce reading about a year earlier. Yet in one study, a group of English children given the *Stanford Achievement Test* made scores very similar to those made by American children of the same age (Scholl, 1960). And in the famous "eight-year study" in which the college achievement of students taught by "progressive" methods in high school was compared with that of traditionally taught students, it was found that the progressively taught students got higher grades in college and were involved in more extracurricular activities (Aikin, 1942). In all these examples, greater time spent on formal instruction and drill failed to yield superior performance. Perhaps at a given time there is an optimal amount and kind of teaching and practice that will take learners to the limit of their current growth status, and additional effort is useless until further growth brings new potential.

At any level, achievement seems to be highly correlated with intellectual development. The children who are high in achievement are consistently higher in IQ, as a group, than those low on the achievement scale. In a typical high-school graduating class, for example, there may be a range of over 100 IQ points, and the top tenth in achievement will be far above the bottom tenth in average IQ. There are many exceptions, of course. Children of mediocre ability sometimes do well through sheer effort and perseverance, and children of high potential sometimes fail. But all the way through the grades we find a high correlation between intelligence and achievement, and we can well wonder how often growth and superior potential may be as important in the results as our teaching. To the extent that it is actually good growth or poor growth we are grading, it seems unfair to give high marks to some and failing grades to others.

The famous Carnegie study some years ago found that a fourth of a group of graduating college seniors did more poorly on comprehensive tests of general information than almost a fourth of the high-school seniors they were going to be teaching (Learned and Wood, 1938). When high-school students who already know more than the teacher continue to improve, can we attribute their gain to teaching?

In another interesting study, a group of bright children were given no reading instruction at all but only informal, nonsystematic encouragement in reading. For four years they lagged behind a group of diligently taught classmates, but by the end of the elementary period their average achievement was eight months beyond that of the taught group, an advantage which corresponded closely to

their 10-point superiority over the others in IQ (Anderson and others, 1956). Does this mean that the usual hours spent teaching reading are unnecessary? This is a crucial question. Time is too precious to be wasted on teaching that is unnecessary, but at the same time, we want to be sure that ample provision is made for the learning that will not come without teaching and planned practice.

It would be anticipated that bright pupils would need less teacher help than average or slow pupils in making the identifications and discriminations involved in learning to read. But even bright children do not learn simply by growing. The children just described would not have learned to read if books had not been in their environment. Nor was their learning a process of osmosis or simple absorption. They had to go through the same steps in identifying symbols and relating them to sounds and words as the taught pupils. The only difference was that given the materials, they were able to go through these steps without help.

What the teacher does that life experiences may not is (a) make sure that the relevant stimulation is present, and (b) see that it is structured in such a way that the important elements stand out for the learner to identify and learn. Some learners need much more of this help than others for a given piece of learning. But one can wonder how much further these bright children might have gone during the same years if they had been given special instruction geared to their ability and readiness. Certainly they did not need the same schedule of exposure, instruction, and practice that the average learners did, but this does not mean that they would make the fullest use of their potential with no instruction at all.

An interesting study some years ago by Berman (1935) shows further the complexity of this whole problem. A group who had the usual systematic arithmetic instruction during the first five grades was compared at the end of the fifth grade with a group who had had no planned lessons in arithmetic and had picked up whatever arithmetic they knew through incidental experiences. The following chart shows the scores made by the two groups:

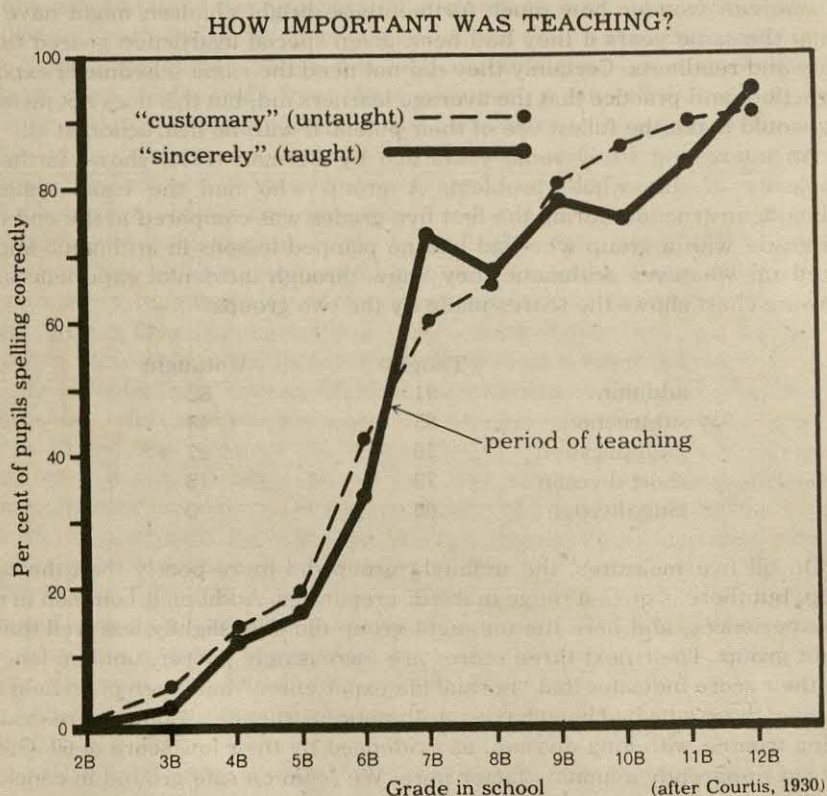
	Taught	Untaught
addition	91	82
subtraction	85	48
multiplication	76	27
short division	73	18
long division	60	0

On all five measures, the untaught group did more poorly than the taught group, but there is quite a range in the discrepancies. Addition is common in many life experiences, and here the untaught group did only slightly less well than the taught group. Their next three scores are increasingly poorer, until on long division their score indicates that "normal life experiences" had been of no help at all. But even those who had been having arithmetic instruction all along were evidently having trouble with long division, as evidenced by their low score of 60. Growth, too, was apparently a limiting factor here. We seem on safe ground in concluding that the more difficult a concept and the more remote it is from general cultural experience, the more necessary it is for the school to design a special teaching sequence if it is to be learned. But the age at which it can be understood, even then, will depend partly on growth.

Are there critical times for learning?

The arithmetic study just described ran another year, during which the previously untaught group received systematic instruction. At the end of the year the two groups made approximately equal scores on their achievement tests. Here we come face to face with another practical problem for the teacher. For those things that do not "come naturally" but must be taught, is there a best time?

Do we waste time by starting too soon? Parents are eager to start their children on piano lessons at an early age, yet positive correlations have been found between age and speed of piano learning: an older child can learn much faster per unit of time put in (Brown, 1936). Third-graders take two to three times as long as seventh-graders to memorize the same poem. Concepts that require laborious teaching in the primary grades—if they can be grasped at all—can often be understood quickly and easily in the upper grades. Besides the greater time and effort required when we start early, we run the risk of giving children a heavy load of frustration and failure, with the possibility of a damaged self-picture



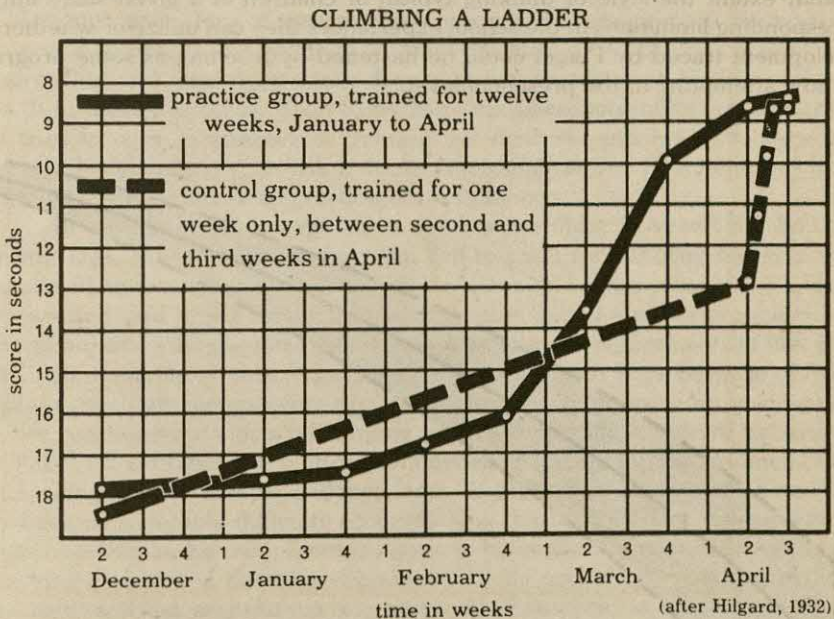
These curves show children's increasing ability to spell two words over a ten-year period. The word "customary" was never taught formally whereas the word "sincerely" was taught in the seventh grade. Except for the temporary rapid improvement in "sincerely" at that time, the curves are discouragingly similar.

and resistance to the learning of a skill or concept later on when growth has given them greater capacity.

Should concepts and skills be taught as early as a child can begin to grasp them, or should we wait until they can be mastered in the shortest time? Is there a timing that will be most conducive to long-term retention and fullest use of what has been learned? Are there stages in a child's development when particular concepts or values will be most meaningful to him and thus most apt to become a permanent part of him? To what extent are there "golden times" for school learnings, with a child less receptive either before or after this time? If a child does not have a chance to learn a concept or skill at the moment he is ready for it, is it harder for him to learn it later on?

Central as these problems are for curriculum makers, our knowledge here is very incomplete. We know that in embryonic development the growth forces are mobilized and focused successively on different organs and members and that if any one misses out at its critical time, there may be permanent defect.

In addition to this, we also have studies of infant emotional development in both humans and lower animals which show that there are normal times for certain early phases of development and that if development is hampered at these times, there is lasting damage. Clinical studies of psychosocial development suggest that there are successive stages here too and that if, for example, an infant

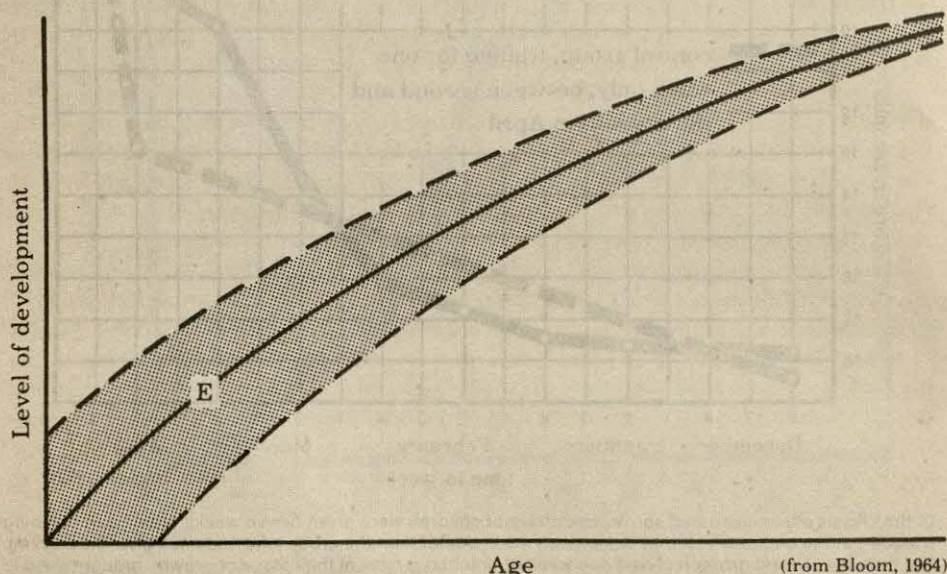


In the classic study illustrated above, one group of children were given twelve weeks' training in climbing a ladder, at the end of which they were much more skillful than the group who had been given no training. But then the second group received *one* week of practice, which, at their stage of growth, brought them to the same level of skill that the first group, starting younger, had needed twelve weeks to achieve. The need for *both* growth and teaching are apparent here as well as their close interdependence and the wastefulness of starting teaching effort too soon.

does not develop a basic sense of trust during his first year, he may never be able to develop it (see p. 82). Studies of "imprinting" in both animals and humans suggest that there is a critical time at which the infant develops an attachment to adults and other members of his species. If prevented from doing so at this time, he may never be able to form the normal attachments later on.

Bloom (1964) has found that certain human characteristics tend to stabilize over time, and that once the process of organization has been completed their basic nature is not easily changed. As the graph below illustrates, environmental conditions, be they advantageous or disadvantageous, exert their greatest effect at that period of development when growth in a given area is most rapid — generally the early stages of development. These findings underline the importance of early environment in setting the stage for future development.

Fragmentary as is our knowledge of critical times in infancy, our knowledge about critical times in school learning is even less complete. Piaget has mapped in greater detail than anyone else the stages by which particular cognitive functions develop and the times at which given concepts may be expected to appear. Unfortunately for the curriculum planner, however, Piaget's detailed work has dealt mainly with the preschool years. Also, his studies have been intensive analyses of relatively few children and have not revealed the range of individual differences that might be anticipated. In any case, little attempt has been made to relate his findings to the placement of school subjects, and we do not even know to what extent the style of thinking typical of children at a given stage implies corresponding limitations in the school experiences they can utilize or whether the development traced by Piaget could be hastened by teaching as some programs are now attempting at the preschool level.



The solid line represents a typical developmental curve for a quantitative measure of some characteristic, and the shaded area represents the limits of variation that the environment can produce at different points in development. As you can see, the possibilities of environmentally produced change are greatest in the early stages of development when change is most rapid.

This is a fertile field for investigation in which research in the next few years may well revolutionize our school planning. Already we are seeing experimentation in the teaching of foreign languages in the elementary school and a recasting of the teaching of arithmetic. Research here needs to answer questions of both the best *timing* for given concepts or skills and the *sequence* in which they should be developed. As we shall see, however, many other factors will always cloud the issue of what is the best time for a given experience. Each learner brings with him a unique constellation of past experiences, interests, motivations, and self-evaluations. These factors are probably as important as the learner's position in the growth sequence in determining the best time for *him* to have a given experience. No matter how much we learn about the potentials of each growth stage, the range of individual differences both in growth and in these other factors is so great that we can never hope to design a single sequence of grade-by-grade, one-exposure, perfectly timed experiences that will fit all pupils.

Teaching for maturity

With the close interrelation of all growth factors, the teacher must perforce be concerned with children's all-round progress toward maturity—not with their advance in intellectual maturity alone. While working ahead toward specific objectives in the various curriculum areas, he finds himself concerned also about what kinds of human beings are emerging.

Although definitions of maturity vary, we would like to propose five attributes that would probably be accepted as characteristic of a mature person.¹⁵ In a hundred big and little ways every day a teacher promotes or hinders children's growth in these attributes. Even if he disclaims all responsibility for such growth and tries to stick to intellectual training, his methods and his attitudes are influencing his youngsters' growth in these other spheres too. So it behooves him to be aware of the nature and direction of his influence.

1. *An adequate self-concept.* As a child grows older in years, he should be growing also in self-understanding and self-respect, for the way he feels about himself will have much to do with the kind of learning he can achieve. A child who feels wanted and loved simply for being himself has the necessary freedom to learn to adjust to the physical, cultural, and emotional requirements of life. But a child who is unable to believe in himself may either hold back because of fear of failure or push on compulsively because of a necessity to prove he is acceptable. Neither reaction produces a wholesome attitude or results in mature behavior.

Take, for example, the high-school boy who is facing the developmental task of achieving emotional independence from his parents. If he distrusts himself, he may have considerable difficulty accomplishing this task. Feeling inadequate and fearful of acting on his own, he may give in to his sense of unworthiness and withdraw into deeper and deeper dependence. Or he may show cockiness and bravado, drive too fast, stay out too late, and defy all authority in an attempt to prove—to himself and others—that he does not need to depend on adults. On the other hand, the boy with an adequate self-concept may meet the need to “strike out on his own” by making new friends, finding a girl, and getting a part-time job, confident that he is worthy of friends, worthy of love, worthy of a job.

¹⁵For an excellent, though somewhat different formulation, see *Current Concepts of Mental Health* by Marie Jahoda (New York: Basic Books, 1958).

Each boy's concept of himself influences the way in which he tries to meet the developmental tasks. And his experiences of success or failure, in turn, further affect his self-concept. If the task comes too early or is too demanding for the boy who is uncertain of himself and if he fails to achieve it, the failure will serve to make him think even less of himself. The boy ready and able to meet the task will find his confidence further reinforced by his success.

Sometimes a child who sees himself as being unwanted by his parents and therefore not worthy of love may learn (at a subconscious level) that through the use of temper tantrums, functional illness, stealing, or other antisocial behavior he can at least attract attention. Such a child can present a real problem and challenge to the classroom teacher. If his undesirable behavior is regarded as originating from innate "meanness" and is treated as such, his behavior is likely to get worse and his feeling that he really is of no account is likely to become more deeply ingrained. If, on the other hand, the teacher looks beyond the behavior to its source and tries to remedy the cause rather than the effect, the child's self-concept of unworthiness may be modified, with corresponding changes in his behavior.

One of the intriguing and baffling things about people's concepts of themselves is how unrealistic they may be. Youngsters of ability may be convinced that they are stupid; a pretty girl may be sure that she is clumsy and unattractive. Or, on the other hand, an incessant talker may fancy himself quite irresistible, and a boy without the necessary aptitudes may confidently plan to become an engineer or a doctor. A child needs to be able to accept himself, but he also needs an accurate picture to accept. Jersild points to "a need of staggering magnitude for doing something in our educational program to help children and youth acquire realistic attitudes of self-acceptance" (1952, p. 5). Maturity cannot come without such attitudes.¹⁶

2. *Development and use of one's capacities.* Maturity implies a satisfactory fulfillment of one's potentialities. This means developing and using one's mental and physical abilities to the fullest possible extent. For example, every pupil except those at the very lowest ranges of intelligence is capable of *thinking*—not just functioning but thinking creatively. But he may never learn to think in this way if he is rewarded for parroting the words of the book and penalized for putting the stamp of his own interpretation on what he studies. If youngsters are to become mature, creative, responsible adults, they need much help during their school years in developing their capacities to analyze, interpret, and evaluate ideas, formulate problems, search for satisfactory answers, and take responsibility.

Besides the capacity they share for creative, responsible thinking, children have different patterns of special abilities and capacities. The school has an important responsibility to help them identify their aptitudes and develop and use the potential that is theirs. Both the individual and the group are the poorer when potential is wasted.

The extent to which a person develops and uses his capacities depends very often on the amount of encouragement he gets. At school it is the teacher who encourages or discourages—six hours a day, five days a week. The cumulative result of this encouragement or discouragement can hardly be overestimated.

¹⁶A scholarly and comprehensive review of the research and writings on the self concept is to be found in R. C. Wylie's *The Self Concept* (Lincoln: University of Nebraska Press, 1961). Theory and research concepts have been brought up to date in an intensive volume by James C. Diggory, *Self-Evaluation: Concepts and Studies* (New York: Wiley, 1966).

3. *Meeting reality without undue stress.* Maturity requires meeting reality without developing crippling emotional and mental conflicts. No one is free from conflicts. There are times when everyone feels indignant, rebellious, anxious, and hostile. But it is important that such conflicts be resolved in realistic ways.

The vast majority of youngsters range somewhere between the few who are obviously maladjusted and the few who are exceptionally secure. They have their difficulties in school and out. They need the support and help of their teachers not because they are or will be "problem children" but because inappropriate or neurotic responses are blocking more mature reactions.

One of the tasks of growing up is to learn to face and meet life demands effectively without paying too high an emotional price. Throughout this book we will examine the things teachers can do to help children with this learning. Such guidance cannot be left to the experts. The teacher who asserts that guidance is "the counselor's business" fails to realize that every classroom interaction has its psychological effects, for good or for ill. Rosenthal (1952) points out that positive psychological guidance is no harder to administer than the negative or disparaging expressions seen every day in the classrooms of unthinking teachers.

4. *Concern for others.* Maturity implies the ability to love beyond oneself. On the foundation of this ability are built an individual's social relationships, his interest in others, his sense of responsibility, and his sociosexual adjustment. Out of the ability to love grows the ability to identify with others and feel their hopes, tensions, worries, and joys—the quality psychologists call *social imagination* or *empathy*. This quality is a prerequisite for being an adequate teacher or parent.

Concern for others motivates much of what is done to improve the lot of mankind. Conscientious citizens will vote for measures benefiting others even at their own personal expense. Some social progress is possible only when men work together in a common cause. But people are not born with a concern for the welfare of others. It has to be learned. This means that unless we are to leave it all to chance, a definite effort must be made toward developing children's capacity for empathy.

An example of what can be done is what happened in a high-school class in human relations. As part of the course, the students were to visit a nearby state mental hospital. Their teacher suggested that before making plans they consider two questions: Who would benefit from their seeing the patients and the institution? Would it do the patients any good to be "looked at"?

The class discussed the problem and decided to go only if they could make a contribution to the welfare of those they were to visit. The resulting trip included giving Christmas gifts to the afflicted children and providing books for the children's ward. This expression of empathy meant personal sacrifice and the use of money that the students had set aside for a party of their own.

5. *Creative participation.* Maturity requires adjusting to and participating creatively in one's environment. Today's citizen, to participate creatively in his world, must be literate in the political, economic, social, scientific, and artistic spheres. This means a good grounding in mathematics and the physical sciences; in history, geography, economics, civics, and other social sciences; and in literature and art and the communication skills.

But a mature adult in our society must do more than know *about* his environment or even become *adjusted* to it. He has a responsibility also to understand it, to appreciate it, and to act to improve it. The mature mind is a creative mind with

the courage, the foresight, and the willingness to work toward an environment embodying all that it holds valuable in terms of human worth and dignity.

Maturity, as we have been discussing it, is the result of many years of healthy growth, something one hopes to reach in adulthood. But there is also a maturity commensurate with each level of development. If a child is developing and using his capacities well, if he is moving from dependence on others toward independence and from absorption in self toward concern for and service to others, if he is taking an active, cooperative part in his social group, then he is a mature five-year-old or eight-year-old or whatever his age may be. If for some reason he is not ready to act and feel and think in ways appropriate to his stage of physical and mental development, we say he is *immature for his age*. As a teacher, you will need to know what maturity is at each level so that you can recognize the individual level of maturity of the children in your care and help them to grow from where they are to some point further along the road toward mature adulthood.

WHAT DO WE MEAN BY "NORMAL"?

Both in school and out we make great use of the terms "normal" and "average." We talk about normal children, normal adults, normal conditions. We talk about normal achievement, and we make judgments as to whether children's achievement is "normal," "above average," or "below average."

We may say, for example, that David is below average in reading while Ralph is above average. This is a straightforward statement meaning that David cannot read as well as the average child of his age and Ralph can read better.

But now, if we are not careful, this "average" or "norm" begins to take on a kind of magical character in our thinking. It becomes not a straightforward statistical statement but an implied *expectation* for each child. Somehow we feel it is wrong for David not to achieve up to the norm. There is a stigma attached to the term "below average."

Parents and teachers often demand that their charges at least hit the average—that is, reach the "norm" for their age. Yet this automatically dooms half of the group to disappointment and failure, for repeated measurements of almost any trait or ability have shown that in any unselected group there will be a *range* of scores. Most of the scores will cluster around the middle with comparatively few far above or far below. But half will be above the actual mid-point, or median, and half below.

These are "normal" children, yet they vary greatly—physically, mentally, and emotionally. They have differed in the *rate* of their growth and in the *quality* of their growth. This is to be expected. If we plotted a line showing their "average" sequence of growth from year to year, it might not correspond with the growth sequence of any one particular child. So it is also when "averages" and "norms" are computed from hundreds or thousands of cases. The "average child" does not exist. He is a statistical concept.

If "average" means "middle," then we see at once the futility of trying to get everyone to achieve the "middle" performance. Knowing the "average" is helpful for comparison and in other ways, but it cannot be an *expectancy* figure for any particular child. We would not call a child lazy for not growing to the height that is "average" for his age. Yet too often we unthinkingly assume that a pupil must be

lazy or "not trying hard enough" if he does not read or spell up to the "average." Maybe he is lazy and maybe not. He may not have the ability to read as well as most others of his age. He may have suffered from poor teaching. He may not be well. He may be disturbed by conflict at home, or he may be insecure at school. Or perhaps his family has taught him to scorn book learning.

There is a legitimate expectancy for each child, but it has nothing to do with the "average." Most children will reach "eight-year-oldness" at about eight, but many normal children will reach it earlier or later. Some children are fast growers, some are slow growers. The slow-growing ones, in fulfilling their own unique growth pattern, may be just as healthy and "normal" as the faster-growing ones.

The word "normal" is a tricky one, for we use it to mean both *average* and *healthy, smoothly functioning*. The first meaning is a simple, statistical one, but the second has connotations of desirability and freedom from "abnormality." It is the confusion of these concepts in calling them by the same name that makes us think of a "norm" as something which all children who are not defective should be able to achieve.

IMPLICATIONS FOR EDUCATIONAL DESIGN

Brief though our excursion into developmental theory has been, it has pointed out the conditions which govern an adequate educational design. Goals can be simply stated but not as simply achieved. We would foster maturity appropriate to his age level for every pupil. This means we would enhance his self-concept and sense of personal identity and worth. We would have social involvement and conformity to reasonable social demands, but without sacrificing whatever creativity and sense of independence the youngster can muster. We would have him use his talents to understand his world as best he may—both its physical and psychological reality. We would anticipate an eventual acceptance of his personal role in society.¹⁷

Obviously the schools are engaged in a vast enterprise. Obviously they fall short of the goal. Why is it that after years and years of exposure with a captive audience we have, along with our successes, so many who drop out before they have acquired the basic understanding or capacity to assume a productive role in society? Why is it that there are so many delinquents and so many unhappy students? Why do so many read poorly—if indeed they read at all? Not forgetting the fact that so many learn so much, why the failures?

Since sputnik, the school has been the whipping post for many a mean slash. In reaction, there have been waves of programs for "getting tough." Get a new curriculum in the midst of the vast expansion of knowledge; put TV and a teaching machine in every classroom; teach in teams; develop a tutoring program, and so on.

Now what have we learned in our examination of developmental psychology that can serve as guidelines to every teacher in every subject?

1. It should be clear that for many pupils influences before school and outside of school create predispositions which are inimicable to healthy develop-

¹⁷For two quite opposite and contradictory approaches to the education of elementary school children, based on different theories of child nature and child development, see Chapters 14 and 15 of *Walden Two* by B. F. Skinner (New York: Macmillan, 1948) and *Summerhill: A Radical Approach to Child Rearing* by A. S. Neill (New York: Hart, 1960), especially pp. 3–12, 24–28, and 45–55.

ment. The school cannot prevent this. Sometimes the pressures are too great for the schools to counteract. However, to the greatest extent possible, the classrooms must be supportive to normal children and compensatory to those who are victims of unfavorable influences. Until we have done all we can, we have done nothing. Even when we have done all we can, there will be some we will not be able to help.

2. One of the themes that emerges from the study of development is that there are sequences of behavior or steps of progress. Each new period builds upon past accomplishments. This emphasizes the need for continuity, for an analysis of the foundation that has been laid in the preceding grades, and a clear awareness of patterns of development. All of the theorists emphasize this, whether they are dealing with the cognitive, social, or interpersonal sphere. All teaching must fit into a sequence.

3. While there is some argument regarding the possibility of accelerating these cycles of growth, it seems clear that there is the possibility of enhancing progress. There is more potential for learning, providing the right experiences are made available, than we might think. We cannot rely on a schedule based on physical development alone. A clear understanding of the way children develop prerequisite concepts is necessary if we are to prevent much of the "missing out" which can later prove catastrophic. You can ask yourself, as you teach, What am I expecting of these youngsters? Is this reasonable? Does each step build on the preceding one and lead logically to the next?

4. Individual differences in both personality and potential are ever present. No two people respond the same way in the same situation. As they grow older, they become more and more individualistic in personality makeup, motivation, interests, and abilities. Recognition of variation should be the keystone of teaching, although the design of many schools makes this difficult. We know that students will differ in rate of learning, in amount gained and retained, and in the style with which they approach tasks. Each has to learn how to learn what he can. In any classroom, homogeneity is a myth.

With so many differences, how can we expect to reach every pupil? First, many pupils will be "around the mean" and that helps us identify a starting place. We can then make whatever accommodations seem necessary in content, rate, and methods of teaching and evaluation. The important thing is that we pay attention to where the pupils *are*, rather than to where we wish they were or where some published curriculum says they ought to be. Too many teachers still act as if a fourth grader were a very different creature from a third grader, as if a wide gulf separated the student in the last year of elementary school from the student in the first year in high school, and as if Latin II were a totally different subject from Latin I, even though the overlap is more impressive than the differences.

The typical school system is organized "vertically," with a steady progression through Grades One, Two, Three, and so on to graduation. Children are grouped according to chronological age, which is only an approximation of their level of learning. They are supposed to move en masse, a certain amount each year or term. Some can and some cannot. The obvious need is to make the rate flexible, allowing each child time to make all the progress he can. Progress from one level to the next should be based upon what has been learned rather than upon the amount of time spent in learning it. Teaching machines may in fact allow much

more flexibility in rate, with each child more on his own. Some children need maximum supervision and guidance. Others can work well in small groups or by themselves—and this is true from the early years through high school. Can we open the design to accommodate such differences? Some adolescents have deep inclinations toward the practical and immediate rather than toward preparation for the future. Have we acknowledged this in the school design? Special talents suggest special foci for different children. Do we provide the channels?

The emerging schools of the future are characterized by multiple approaches and a reduction of the lock-step grade formula. Evaluation does not mean passing or failing students, but letting both the student and the system see where he is in his relationship to the task rather than his position in the group. Some young people need four years for high school, others might be better off with three or six, just as some pupils need three years to get ready for fourth grade while some require less and others more. One student is language facile; another must put forth three times the effort to come to grips with such symbols. In a science class, where learning is more concrete, their positions may be reversed. Libraries are giving way to resource centers where individuals can carry out their own projects, whether in writing, science, or learning a foreign language. There are independent study, tutorials, small-group experiences, and large lecture classes. Can we introduce variety of opportunity to fit our variety of pupils? The situation is never simple. While we want to accommodate to individual differences in as many ways as possible, we also want to stimulate and encourage every pupil to use his abilities, if not to the utmost, at least nearly so. The able as well as the less able need to be assisted. Accommodation to differences does not mean allowing anyone to coast.

But motivation, too, is idiosyncratic, and as the system relaxes its goose-step conformity, teachers must take a new look at motivation and counseling. Thus we study how children grow, then how they learn and how they can be stimulated to high output, whatever that may mean for a given individual.

Reading

Harold M. Skeels

ADULT STATUS OF CHILDREN WITH CONTRASTING EARLY LIFE EXPERIENCES

It is not often that psychologists have the opportunity to conduct a controlled study of the relationship of intelligence to early environment. Rarer still is the likelihood of "tracking down" all the original subjects of such a study twenty years later. Yet the author of this report has succeeded in doing both.

This is a study of two groups of children, some of whom spent their early childhood in an orphanage for normal children, others on the wards of a hospital for

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mental retardates. As we read of the fate of the contrast-group children, we are tempted to comfort ourselves with the thought that this all happened "back in the thirties," when institutional conditions were not what they are today. Nevertheless, the prospective teacher would do well to remember that a child of today can be just as starved for attention and affection as a child of yesterday—and that not all such love-starved children are in institutions.

A follow-up study that covers a span of some 30 years will inevitably bracket changes in psychological concepts and practices. In the early 1930's when the subjects of this report were identified as infants, the prevailing concept of intelligence held by psychologists, social workers, and educators was that intelligence is a fixed individual characteristic. It was believed to be related to parental genetic traits that were inferred from the parents' occupational and educational achievements, to show little fluctuation from early childhood to maturity, and to be relatively uninfluenced by the impact of environment. Assessment of the intelligence of young children, while difficult, was regarded as not impossible. It was believed that knowing a child's mental level facilitated planning for his future, since the developmental quotient was considered to be an acceptably stable predictor of his future development. In the absence of reliable measures for an infant, for example, the parents' educational achievement, occupational classification, and general sociocultural status were considered to be predictive of the child's potentialities.

In developing plans for dependent children, social workers in the more sophisticated agencies placed considerable emphasis on details of family history. The resulting assessment of potential was used as a basis for matching children and prospective adoptive parents or for making other plans for the child. When such information was not available, or was unfavorable, the child was held for observation until his development could be assessed. For some children this meant several years of observation. Since foster homes were relatively scarce, most children in this category were detained in orphanages during the observation period.

At the same time, some agencies were not influenced by the prevailing, academically accepted concepts of intelligence and of prediction of future development. In these agencies, a variety of practices was found ranging from indiscriminate placements in adoptive homes to early diagnosis of retardation.

The validity of what were then regarded as desirable practices had never been empirically tested, nor was there evidence to contradict them. Conducting planned and carefully designed research in the area was out of the question for both financial and humanitarian reasons. However, the possibility of observing and studying the results of existing practices was completely feasible. The natural-history approach of observing, measuring, recording, and interpreting data without intervention in the practices that produced them was basic to the initial reports in the so-called Iowa Studies. . . .

The present study is a report on the status as adults of two groups of children originally encountered in the Iowa institutions. One group experienced what was then regarded as the normal course of events in a child-caring institution, while the other experienced a specifically designed and implemented intervention program. . . . The findings reported here, therefore, are concerned with the ques-

tion of whether and for how long a time mental development is affected by major changes in early environment and, specifically, with the factors significantly associated with deflections in mental development. It is hoped that these findings will contribute to the growing body of evidence on the effects of deprivation and poverty on the young child's ability to learn. . . .

The original study

All the children in this study had become wards of the orphanage through established court procedures after no next of kin was found able to provide either support or suitable guardianship. Of the 25 children, 20 were illegitimate and the remainder had been separated from their parents because of evidence of severe neglect and/or abuse. Then as now, the courts were reluctant to sever the ties between child and parents and did so only when clearly presented with no other alternative. All the children were white and of north-European background.

The orphanage in which the children were placed occupied, with a few exceptions, buildings that had first served as a hospital and barracks during the Civil War. The institution was overcrowded and understaffed. By present standards, diet, sanitation, general care, and basic philosophy of operation were censurable. At the time of the study, however, the discrepancies between conditions in the institution and in the general community were not so great and were not always to the disadvantage of the institution. . . .

At the time the original study was begun, infants up to the age of 2 years were housed in the hospital, then a relatively new building. Until about 6 months, they were cared for in the infant nursery. The babies were kept in standard hospital cribs that often had protective sheeting on the sides, thus effectively limiting visual stimulation; no toys or other objects were hung in the infants' line of vision. Human interactions were limited to busy nurses who, with the speed born of practice and necessity, changed diapers or bedding, bathed and medicated the infants, and fed them efficiently with propped bottles.

Older infants, from about 6 to 24 months, were moved into small dormitories containing two to five large cribs. This arrangement permitted the infants to move about a little and to interact somewhat with those in neighboring cribs. The children were cared for by two nurses with some assistance from one or two girls, 10 to 15 years old, who regarded the assignment as an unwelcome chore. The children had good physical and medical care, but little can be said beyond this. Interactions with adults were largely limited to feeding, dressing, and toilet details. Few play materials were available, and there was little time for the teaching of play techniques. . . .

At 2 years of age these children were graduated to the cottages, which had been built around 1860. A rather complete description of "cottage" life is reported by Skeels et al. (1938) from which the following excerpts are taken:

Overcrowding of living facilities was characteristic. Too many children had to be accommodated in the available space and there were too few adults to guide them. . . . Thirty to thirty-five children of the same sex under six years of age lived in a "cottage" in charge of one matron

and three or four entirely untrained and often reluctant girls of thirteen to fifteen years of age. The waking and sleeping hours of these children were spent (except during meal times and a little time on a grass plot) in an average-sized room (approximately fifteen feet square), a sunporch of similar size, a cloakroom, . . . and a single dormitory. . . .

With so much responsibility centered in one adult the result was a necessary regimentation. The children sat down, stood up, and did many things in rows and in unison. They spent considerable time sitting on chairs, for in addition to the number of children and the matron's limited time there was the misfortune of inadequate equipment. . . .

No child had any property which belonged exclusively to him except, perhaps, his tooth brush. Even his clothing, including shoes, was selected and put on him according to size [pp. 10-11].

After a child reached the age of 6 years, he began school. His associates were his cottage mates and the children of the same age and opposite sex who lived on the other side of the institution grounds. Although the curriculum was ostensibly the same as that in the local public school, it was generally agreed that the standards were adjusted to the capabilities of the orphanage children. Few of those who had their entire elementary-school experience in the institution's school were able to make the transition to the public junior high school. . . .

Identification of cases Early in the service aspects of the program, two baby girls, neglected by their feeble-minded mothers, ignored by their inadequate relatives, malnourished and frail, were legally committed to the orphanage. The youngsters were pitiful little creatures. They were tearful, had runny noses, and sparse, stringy, and colorless hair; they were emaciated, undersized, and lacked muscle tonus or responsiveness. Sad and inactive, the two spent their days rocking and whining.

The psychological examinations showed developmental levels of 6 and 7 months, respectively, for the two girls, although they were then 13 and 16 months old chronologically. . . .

The two children were considered unplaceable, and transfer to a school for the mentally retarded was recommended with a high degree of confidence. Accordingly, they were transferred to an institution for the mentally retarded at the next available vacancy, when they were aged 15 and 18 months, respectively.

In the meantime, the author's professional responsibilities had been increased to include itinerant psychological services to the two state institutions for the mentally retarded. Six months after the transfer of the two children, he was visiting the wards at an institution for the mentally retarded and noticed two outstanding little girls. They were alert, smiling, running about, responding to the playful attention of adults, and generally behaving and looking like any other toddlers. He scarcely recognized them as the two little girls with the hopeless prognosis, and thereupon tested them again. Although the results indicated that the two were approaching normal mental development for age, the author was skeptical of the validity or permanence of the improvement and no change was instituted in the lives of the children. Twelve months later they were re-examined, and then again when they were 40 and 43 months old. Each examination gave

unmistakable evidence of mental development well within the normal range for age.

There was no question that the initial evaluations gave a true picture of the children's functioning level at the time they were tested. It appeared equally evident that later appraisals showed normal mental growth accompanied by parallel changes in social growth, emotional maturity, communication skills, and general behavior. In order to find a possible explanation for the changes that had occurred, the nature of the children's life space was reviewed.

The two girls had been placed on one of the wards of older, brighter girls and women, ranging in age from 18 to 50 years and in mental age from 5 to 9 years, where they were the only children of preschool age, except for a few hopeless bed patients with gross physical defects. An older girl on the ward had "adopted" each of the two girls, and other older girls served as adoring aunts. Attendants and nurses also showed affection to the two, spending time with them, taking them along on their days off for automobile rides and shopping excursions, and purchasing toys, picture books, and play materials for them in great abundance. The setting seemed to be a homelike one, abundant in affection, rich in wholesome and interesting experiences, and geared to a preschool level of development.

It was recognized that as the children grew older their developmental needs would be less adequately met in the institution for the mentally retarded. Furthermore, they were now normal and the need for care in such an institution no longer existed. Consequently, they were transferred back to the orphanage and shortly thereafter were placed in adoptive homes.

At this point, evidence on the effects of environment on intelligence had been accumulated from a number of studies. Skeels and Fillmore (1937) had found that older children who came from inadequate non-nurturant homes were mentally retarded or borderline but that their younger siblings were generally of normal ability, which suggested that longer residence in such homes had a cumulatively depressing effect on intelligence. Children also became retarded if they remained for long periods in an institution (1930-style) supposedly designed for normal children (Skeels, 1940). However, if children were placed in adoptive homes as infants, or even as young preschoolers, their development surpassed expectations, and improvement continued for long periods following placement (Skodak, 1939). In even more extreme cases, seriously retarded children were able to attain normal levels of functioning when placed in a setting officially designed for the mentally retarded (Skeels & Dye, 1939). The consistent element seemed to be the existence of a one-to-one relationship with an adult who was generous with love and affection, together with an abundance of attention and experiential stimulation from many sources. Children who had little of these did not show progress; those who had a great deal, did. . . .

By the time these observations were organized into a meaningful whole and their implications were recognized, individual psychological tests were available for all children in the orphanage. As part of a continuing program of observation and evaluation, all infants over 3 months of age were given the then available tests, and were retested as often as changes seemed to occur. . . .

Children whose development was so delayed that adoptive placement was out of the question remained in the orphanage. The only foreseeable alternative for them was eventual transfer to an institution for the mentally retarded. In the

light of the experiences with the two little girls, the possibility was raised that early transfer to such an institution might have therapeutic effects. If not all, then at least some of the children might be able to attain normal mental functioning. In the event they did not, no significant change in life pattern would have occurred, and the child would remain in the situation for which he would have been destined in any case.

This radical proposal was accepted with understandable misgivings by the administrators involved. It was finally agreed that, in order to avoid the stigma of commitment to a state school for the retarded, children would be accepted as "house guests" in such institutions but would remain on the official roster of the orphanage. Periodic re-evaluations were built into the plan; if no improvement was observed in the child, commitment would follow. Insofar as possible, the children were to be placed on wards as "only" children.

In the course of time, in addition to the two little girls who have been described and another transferred to the second of the two institutions at about the same time, 10 more children became "house guests." The transfers were spaced over a year's span in groups of 3, 3, and 4. All went to one institution for the mentally handicapped, the Glenwood State School. Unfortunately, the number of "house guests" exceeded the number of "elite" wards of older girls and necessitated the use of some environments that were less desirable. Consequently, in some wards there were more children, or fewer capable older girls, or less opportunity for extra stimulation, with a resulting variation in developmental patterns.

The experimental group consisted of the 13 children who were transferred from an orphanage for mentally normal children to an institution for the mentally retarded, as "house guests." All were under 3 years of age at the time of transfer. Their development had been reliably established as seriously retarded by tests and observation before transfer was considered. . . .

At the time of transfer, the mean chronological age of the group was 19.4 months and the median was 17.1 months, with a range of from 7.1 to 35.9 months. The range of IQ's was from 35 to 89 with a mean of 64.3 and a median of 65.0. . . .

Since the original purpose of the experiment was to rescue for normalcy, if possible, those children showing delayed or retarded development, no plans had been made for a control or comparison group. It was only after the data had been analyzed that it was found that such a contrast group was available because of the tests that were routinely given to all children in the orphanage. . . .

A total of 12 children . . . became the contrast group. The mean chronological age of the group at the time of first examination was 16.6 months, with a median at 16.3 months. The range was from 11.9 to 21.8 months. The mean IQ of the group was 86.7 and the median IQ was 90. With the exception of two cases the children had IQ's ranging from 81 to 103; the IQ's for the two exceptions were 71 and 50, respectively. When the children were examined, it was not known that they were or would become members of any study group. . . .

At the ages when adoptive placement usually occurred, nine of the children in the contrast group had been considered normal in mental development. All 12 were not placed, however, because of different circumstances. . . .

The subsequent progress of the children in both the experimental and the contrast groups was influenced by individual circumstances. The groups were

never identified as such in the resident institution; the members of each group were considered together only in a statistical sense. A child in the experimental group remained in the institution for the mentally retarded until it was felt that he had attained the maximum benefit from residence there. At that point, he was placed directly into an adoptive home or returned to the orphanage in transit to an adoptive home. If he did not attain a level of intelligence that warranted adoptive plans, he remained in the institution for the mentally retarded.

The contrast-group members remained in the orphanage until placement. One was returned to relatives, but in most instances the children were eventually transferred to an institution for the mentally retarded as long-term protected residents. A few of the contrast group had been briefly approved for adoptive placement, and two had been placed for short periods. None was successful, however, and the children's decline in mental level removed them from the list of those eligible for adoption. . . .

Description of the environments Children in the experimental group were transferred from the orphanage nursery to the Glenwood State School, an institution for mentally retarded, and were placed on wards with older, brighter inmate girls. . . . It was planned to place one, or at the most two, children from the experimental group on a given ward.

As with the first two children, who, by chance, were the first participants in the experiment, the attendants and the older girls became very fond of the children placed on their wards and took great pride in them. In fact, there was considerable competition among wards to see which one would have its "baby" walking or talking first. Not only the girls, but the attendants spent a great deal of time with "their children," playing, talking, and training them in every way. The children received constant attention and were the recipients of gifts; they were taken on excursions and were exposed to special opportunities of all kinds. . . .

The spacious living rooms of the wards furnished ample space for indoor play and activity. Whenever weather permitted, the children spent some time each day on the playground under the supervision of one or more older girls. Here they were able to interact with other children of similar ages. Outdoor play equipment included tricycles, swings, slides, sand boxes, etc. The children also began to attend the school kindergarten as soon as they could walk. . . .

In considering this enriched environment from a dynamic point of view, it must be pointed out that in the case of almost every child, some one adult (older girl or attendant) became particularly attached to him and figuratively "adopted" him. As a consequence, an intense one-to-one adult-child relationship developed, which was supplemented by the less intense but frequent interactions with the other adults in the environment. Each child had some one person with whom he was identified and who was particularly interested in him and his achievements. This highly stimulating emotional impact was observed to be the unique characteristic and one of the main contributions of the experimental setting.

The meager, even desolate environment in the orphanage has been described. The contrast between the richly stimulating, individually oriented experience of the children in the experimental group and the depersonalizing, mass handling, and affectionless existence in the children's home can hardly be emphasized enough.

Mental development The mental development of individual children in the experimental group from the beginning to the end of the experimental periods is presented in Table 1. . . . Test one was the measure of intelligence just prior to transfer. . . . The last test was given at the end of the experimental period . . . Similar data showing the mental growth of the individual children in the contrast group over the 2 1/2-year period are presented in Table 2.

. . . Every child [in the experimental group] showed a gain of from 7 to 58 points. Three children made gains of 45 points or more, and all but two children gained more than 15 points (Table 1).

TABLE 1 EXPERIMENTAL GROUP

Case Number	IQ Before Transfer	Age (months) at transfer	Length of Experimental Period (months)	IQ at end of Experimental Period	Change in IQ
1	89	7.1	5.7	113	+24
2	57	13.1	23.7	77	+20
3	85	13.3	11.9	107	+22
4	73	15.0	8.1	100	+27
5	46	15.2	24.8	95	+49
6	77	15.6	14.5	100	+23
7	65	17.1	10.4	104	+39
8	35	18.4	24.6	93	+58
9	61	22.0	12.3	80	+19
10	72	23.4	22.0	79	+7
11	75	27.4	23.6	82	+7
12	65	28.4	12.0	82	+17
13	36	35.9	52.1	81	+45
Mean	64.3	19.4	18.9	91.8	+27.5

Length of the experimental period was from 5.7 months to 52.1 months. The period was not constant for all children as it depended upon the individual child's rate of development. As soon as a child showed normal mental development, as measured by intelligence tests and substantiated by qualitative observations, the experimental period was considered completed and the child's visit to the school for mentally retarded was terminated. Either he was placed in an adoptive home or returned to the orphanage. . . .

The mental-growth pattern for children in the contrast group was quite opposite that of the experimental group. . . . With the exception of one child who gained 2 points in IQ from first to last test, all children showed losses of from 9 to 45 points. Ten of the 12 children lost 15 or more points in IQ over the period of the study.

A close bond of love and affection between a given child and one or two adults who assume a very personal parental role appears to be a dynamic factor of great importance. Nine of the 13 children in the experimental group were involved in such relationships. The four other children tended to be less individualized on the wards; their relationships with adults were more general, less

intense, and did not involve any individual adult. It is significant that the children who experienced the more intense personal relationships made greater gains than those who were limited to more general interactions. The 9 children in the "personal" group made gains in IQ ranging from 17 to 58 points, with an average gain of 33.8 points. The 4 children in the more "general" group made gains of from 7 to 20 points, with an average of 14. . . .

TABLE 2 CONTRAST GROUP

Case Number	First Test		Months Between Tests	Last Test		Change in IQ
	Age (months)	IQ		Age (months)	IQ	
14	11.9	91	43.1	55.0	62	-29
15	13.0	92	25.3	38.3	56	-36
16	13.6	71	27.3	40.9	56	-15
17	13.8	96	39.4	53.2	54	-42
18	14.5	99	27.4	41.9	54	-45
19	15.2	87	29.3	44.5	67	-20
20	17.3	81	35.6	52.9	83	+ 2
21	17.5	103	32.8	50.3	60	-43
22	18.3	98	21.4	39.7	61	-37
23	20.2	89	28.2	48.4	71	-18
24	21.5	50	30.1	30.1	42	- 8
25	21.8	83	28.3	50.1	60	-23
Mean	16.6	86.7	30.7	47.2	60.5	-26.2

First follow-up

The experiment ended for each child in the experimental group when the decision was made that he had attained the maximum benefit from his "house-guest" experience. Of the 13, one remained in the institution until adulthood, 5 went directly into adoptive homes from the host institution, 6 had brief periods in the orphanage in transit to adoptive homes, and one was returned to the orphanage for some years and then was committed to the institution for the retarded. . . .

Six of the contrast children were transferred to the Woodward State Hospital and School following the close of the experimental period. This transfer was made on a permanent basis, inasmuch as mental retardation and lack of development and adjustment made continued residence in the orphanage seem inadvisable. Four of the children were transferred within three months after the close of the experimental period, and the other two were transferred 16 months after the close of the experimental period.

The children sent to Woodward experienced a different environment from that of the experimental children who had been "house guests" at Glenwood. The children sent to Woodward were much older at the time of transfer and received, in general, less individual attention and had fewer interactions with adults. They

interacted primarily with children of a similar or slightly older chronological age who were mentally more retarded. . . .

Of the three children who remained in the orphanage, Case 19 had the most enriched and varied experience during the follow-up period and showed by far the greatest gain (22 points) in IQ. Beginning at 5 years of age, he spent one year in preschool and one year in kindergarten. During the year in kindergarten, he was also included in a special mental-growth stimulation study, which was carried on by a research assistant from the State University of Iowa (Dawe, 1942), that included an intensified, individualized program of experimental instruction and frequent trips away from the institution. He was the only child from the contrast group included in this special study.

The first follow-up study was made 2 1/2 years after the termination of the original study. The 11 children in the experimental group that had been placed in adoptive homes had maintained and increased their earlier gains in intelligence, whereas the two not so placed had declined in rate of mental growth. Over the three-year postexperimental period, the children in the contrast group showed a slight mean gain in IQ but were still mentally retarded to a marked degree. In those children that showed gains in intelligence, the gains appeared to be associated with improved environmental experiences that occurred subsequent to the original study.

Adult follow-up

In the adult follow-up study, all cases were located and information obtained on them, after a lapse of 21 years.

The two groups had maintained their divergent patterns of competency into adulthood. All 13 children in the experimental group were self-supporting, and none was a ward of any institution, public or private. In the contrast group of 12 children, one had died in adolescence following continued residence in a state institution for the mentally retarded, and 4 were still wards of institutions, one in a mental hospital, and the other 3 in institutions for the mentally retarded.

In education, disparity between the two groups was striking. The contrast group completed a median of less than the third grade. The experimental group completed a median of the twelfth grade. Four of the subjects had one or more years of college work, one received a B.A. degree and took some graduate training.

Marked differences in occupational levels were seen in the two groups. In the experimental group all were self-supporting or married and functioning as housewives. The range was from professional and business occupations to domestic service, the latter the occupations of two girls who had never been placed in adoptive homes. In the contrast group, four (36%) of the subjects were institutionalized and unemployed. Those who were employed, with one exception (Case 19), were characterized as "hewers of wood and drawers of water." . . .

Educational and occupational achievement and income for the 11 adopted subjects in the experimental group compared favorably with the 1960 U.S. Census figures for Iowa and for the United States in general. Their adult status was equivalent to what might have been expected of children living with natural

parents in homes of comparable sociocultural levels. Those subjects that married had marriage partners of comparable sociocultural levels.

Eleven of the 13 children in the experimental group were married; 9 of the 11 had a total of 28 children, an average of three children per family. On intelligence tests, these second-generation children had IQ's ranging from 86 to 125, with a mean and median IQ of 104. In no instance was there any indication of mental retardation or demonstrable abnormality. Those of school age were in appropriate grades for age.

In the contrast group, only two of the subjects had married. One had one child and subsequently was divorced. Psychological examination of the child revealed marked mental retardation with indications of probable brain damage. Another male subject (Case 19) had a nice home and family of four children, all of average intelligence.

The cost to the state for the contrast group, for whom intervention was essentially limited to custodial care, was approximately five times that of the cost for the experimental group. It seems safe to predict that for at least four of the cases in the contrast group costs to the state will continue at a rate in excess of \$200.00 per month each for another 20 to 40 years.

Implications of study

At the beginning of the study, the 11 children in the experimental group evidenced marked mental retardation. The developmental trend was reversed through planned intervention during the experimental period. The program of nurturance and cognitive stimulation was followed by placement in adoptive homes that provided love and affection and normal life experiences. The normal, average intellectual level attained by the subjects in early or middle childhood was maintained into adulthood.

It can be postulated that if the children in the contrast group had been placed in suitable adoptive homes or given some other appropriate equivalent in early infancy, most or all of them would have achieved within the normal range of development, as did the experimental subjects.

It seems obvious that under present-day conditions there are still countless infants born with sound biological constitutions and potentialities for development well within the normal range who will become mentally retarded and noncontributing members of society unless appropriate intervention occurs. It is suggested by the findings of this study and others published in the past 20 years that sufficient knowledge is available to design programs of intervention to counteract the devastating effects of poverty, sociocultural deprivation, and maternal deprivation.

Since the study was a pioneering and descriptive one involving only a small number of cases, it would be presumptuous to attempt to identify the specific influences that produced the changes observed. However, the contrasting outcome between children who experienced enriched environmental opportunities and close emotional relationships with affectionate adults, on the one hand, and those children who were in deprived, indifferent, and unresponsive environments, on the other, leaves little doubt that the area is a fruitful one for further study. . . .

ELEMENTARY-SCHOOL CHILDREN

Six to twelve is a time for learning. The child during this period wants to know everything about everything. It is a time of exuberance and activity; a time of eagerness and curiosity.

These are important years for the teacher to understand. They are the first six years the child spends in school. As a teacher, you will want to know what the child is like and what he does during these years. Even more, you will want to know why he does these things and what he is capable of doing.

Actually, we cannot describe the "average" child because he does not exist. The individual children in any teacher's classroom cannot be fitted neatly into any orderly system of classification. Each one has his own needs, his own interests, his own abilities. Each one brings to the classroom his own unique background. And, equally important, each one has his own picture of himself—of what kind of a person he is and what he can accomplish. Today, professional interest in the study of children is shifting from attempts at generalized descriptions to a search for underlying causes and motivations in development and behavior.¹

In this chapter, therefore, we shall not attempt to show a picture of the typical six-year-old or the typical nine-year-old, but rather to understand how and why children develop as they do. As you get a feel for the developmental tasks the youngsters are trying to meet during this period, you will find needs and interests that the school can capitalize on. You will also become aware of the points where teacher goals and pupil goals are likely to conflict.

MEET THE FOURTH GRADERS

The first thing we will do is take a look at four children, all of whom live in the same elementary-school district and are in the same fourth-grade classroom. This quick look will serve to emphasize both the similarities and the differences that teachers can expect to find among children of the same age group.

¹Useful general references on the preadolescent include *Behavior and Development from Five to Twelve* (New York: Harper & Row, 1962) and *The Young Child: Reviews of Research* (National Association for the Education of Young Children, 1967).

For observation

THIS IS JOE

First, there is Joe. Joe lives on the east side of the Maxwell Elementary School District with his father, mother, and a sister who is three years older than Joe. This part of the school district is made up of new or relatively new houses, none of them more than ten years old. It is a place of neat, green lawns and carefully tended shrubbery. Two blocks away is a park of several acres with playgrounds and natural areas of trees and native shrubs. In the other direction from Joe's house there is a plot of land as yet undeveloped. Here, hidden behind a thicket of young saplings, Joe and some of his pals have built a shack which is the headquarters of their "secret gang."

Joe's house is tastefully furnished and is always neat and clean, for his mother is a good housekeeper and twice a week a woman comes in to help with the work. One of the three bedrooms of the house belongs to Joe. Here he keeps his clothes and toys and other possessions. He has a desk for his books and papers and here he does his homework. Joe likes having a desk like the one used by his father, who is an increasingly successful consulting engineer.

Joe is supposed to take care of his room and keep it neat, but he is not very good at this; his mother has to keep after him to pick up his clothes and put his things away. Sometimes Joe loses his patience over his mother's insistence on order in his room and sometimes his mother loses hers over Joe's failure to comply. But for the most part, they get along and resolve their differences without much strain.

Joe's is a close-knit family. Joe loves and respects his parents. He is still dependent on them, particularly his mother, but he does not like to show this very much, now that he is older. Joe likes to do things with his father, particularly sports. In fact, Joe never feels better than when his father gets home from the office early enough to play catch or pass a football with him. Sometimes on a Saturday afternoon his father will take Joe into the city to a baseball game. They eat peanuts and hot dogs and drink cokes and then Joe has no appetite for dinner, which brings disapproving glances from his mother. This does not bother Joe very much because he is supremely happy. He has been in a man's world with the man he admires most—even more than the shortstop on his favorite team.

In the summer Joe's whole family goes on long motor trips. Sometimes they camp out in the mountains or in a park and sometimes they stay in motels where his mother sees to it that Joe takes a good hot bath. Joe likes camping better. By the age of nine Joe already has been in many sections of the country. He has seen plains and mountains and great rivers. In fact, he has already seen more of his country than most adults of a generation or so ago ever saw in a lifetime.

Joe is in the fourth grade at Maxwell School. He likes almost everything about school, but there are some things he likes better than others. In the first grade Joe was introduced to reading. It was slow going at first and his interest often outran his ability to read. Sometimes he found it discouraging that three or four girls in the class made faster progress than he did. But his progress was steady and he learned to like books more all the time. Before long, he began to borrow books from the school library to read at home, though he still liked to have his mother or

father read to him in the evening—something they have done ever since Joe can remember. In the second grade some of the girls were still ahead of him in reading ability, but reading had come to mean a great deal to Joe.

By the time he was seven he had some idea of the money system and could manage his weekly allowance. He could tell time by the clock and keep score in simple games. By the time he was eight Joe could add and subtract on paper, though he was not always sure of what he was doing. Now in the fourth grade, he has a fairly good understanding of addition, subtraction, multiplication, and division. He can measure with a ruler and understands measures of distance. There are some things about the “new math,” however, that are still mysteries to Joe.

Still, the fact is that the dominating aspect of Joe’s life has always been—and, at the age of nine, still is—what adults commonly call play. When he was six and seven and well into eight Joe liked to play at the work of adults. He was by turns a fireman, a space pilot, a cowboy, a soldier. Wheeled vehicles had attracted him since he owned his first tricycle at the age of three. Later he had a larger tricycle, a wagon, and roller skates. On his seventh birthday he received a bicycle which he soon learned to ride well.

By the middle of his eighth year, Joe was becoming interested in organized games. Boys in his class at school began to play softball and touch football. At home the boys in the neighborhood play these games in the park. Joe’s greatest glory comes when he can get his father to watch—or, even better, to play in these games.

Joe has always enjoyed making things. He has had crayons and paints since he was a small child. When he was eight, his father gave him some woodworking tools for Christmas. He learned to salvage scrap lumber and he and his friends built a shack on the vacant lot and they also made some ingenious “racers” and other articles. When they get tired of one of their contraptions, they break it up and start something else.

And so here is Joe. In all his life he has never known what it is to go hungry or cold or unwanted. He has always had a good home, a secure family life, and the love and support of his parents. Yet Joe is learning that life cannot be all sunshine. Already at nine he is beginning to cast off some of the ties of his family, foreshadowing the onset of adolescence. He is a member of a neighborhood gang and is beginning to pay attention to the opinions of his friends. Occasionally he is torn between the wishes of his family and the demands of the gang. Sometimes life for Joe is perplexing and discouraging. Grief is sudden and intense but, on the whole, quick in passing. For the most part, Joe finds it is a good life.

For observation

THIS IS JANE

Now, here is Jane. Jane lives with her parents and four brothers and sisters in a house several blocks from Joe’s home. Hers is a neighborhood of modest houses spaced closely together on small lots. Some of the houses are in good repair, the tiny yards are tended, and some have small vegetable gardens in the backyards.

Other houses show evidence of neglect that in some cases approaches real squalor.

Jane's father is a truck driver for a local firm and, although he is making more money than ever before, the family finds it difficult to make his weekly wages cover its needs. Jane shares one of the three small bedrooms in the house with her two older sisters. Even with bunk beds, the room is so small that the girls can scarcely find room for their clothes and other possessions. There is no real privacy anywhere in the house. Usually the large television set in the living room is going full blast and in the evening it always is, for Jane's family gets most of its recreation in front of the TV. Jane's father and mother always look through the newspaper after supper and her father reads the sports page with care, but there are no books in the house and the only magazines are a popular picture magazine and a movie magazine that one of Jane's sisters subscribes to.

Jane's mother is a hard worker who does the best she can to keep the house clean and tidy. She sews some of the children's clothes and, since family finances are tight, she alters some of the older girls' clothes to fit Jane. Jane does not like to wear hand-me-downs and sometimes she bitterly resents seeing her sister get a new dress while she has to be content with something the others have outgrown. Sometimes Jane gets a new dress or some new shoes, but these occasions seem few and far between to her. Jane thinks that what she would like more than anything else in the world is a trunk full of brand-new clothes.

The life of the family is fairly close knit, although the two older girls are beginning to go out with boys and Jane senses a certain anxiety in her mother. Her mother dropped out of school at sixteen to be married and Jane has heard her say many times that she doesn't want her children to do this. They must all finish high school, she says, so they can be *somebody*. Jane knows this is very important to her mother.

Jane identifies closely with her mother and tries to please her, particularly about schoolwork. She finds it hard to do her homework, for there is no place to work except the kitchen table and that has to be shared with her siblings. There is usually a good deal of squabbling among them. And there is always the sound of the television in the next room. It is hard for her to concentrate, particularly since she would rather be watching the program in progress anyway.

Jane's relations with her father are not very close, although as a rule they are not unpleasant. She is a little afraid of him, although if she were asked she could not tell why. The father pays little attention to his daughters, although he does some things with his sons. When he comes home from work he is tired and only wants his supper and his paper and his television programs. Jane knows that he is worried constantly about money and on occasion he quarrels with his wife about some expenditure. These episodes always create anxious feelings in Jane.

Jane has never been very far from home—in fact, she has never been outside the state in which she was born. Sometimes the family visits relatives in nearby towns but their automobile is old and not very dependable, there is little money available for trips, and so they do not go very far. Jane's horizons are restricted pretty much to her neighborhood, her town, and what she sees on television.

Jane does well enough at school and is rated as an "average" pupil. She likes school for the most part, but actually she finds little of real interest there. She does her work, but it is more to please her mother and her teacher than because she finds school work interesting.

At school she tends to associate with the girls from her own immediate neighborhood. The girls who come from Joe's part of the district are better dressed and they take dancing lessons. A few of them even go to the beauty parlor to have their hair dressed for special occasions. All this makes Jane feel shy and inadequate. It also makes her feel resentful sometimes, but she has learned to mask her feelings. Her solution is to withdraw into her small circle of immediate acquaintances or to be alone.

So, this is Jane. She too has never gone hungry or cold. Her family life is reasonably secure and she finds acceptance from her parents—particularly her mother. But even at nine Jane is affected by the anxieties stemming from the adult world, particularly those involving lack of money. Jane knows what it is to be poor and she is haunted by the fear she has often heard her mother express—what if her father should lose his job?

Jane would like to share her mother's indomitable ambition that she should get ahead, but somehow she finds it difficult. Jane is not really very interested in school, though she does the work that is asked of her. Her horizons are severely limited. She has never been anywhere, she never reads books, except in school. The truth is that Jane does not have any very clear idea of what it means to get ahead, except that it means to have lots of money and pretty clothes like those the people have on television.

For observation

THIS IS JILL

Now, here is Jill. Jill lives with her mother in a new apartment building that overlooks the park where Joe and his friends play. This residence is expensive and therefore exclusive. The tenants are upper-middle class and given to an endless round of entertaining with lavish parties. Jill's parents were divorced when she was six years old. Both come from wealthy families. Her father is a graduate of one of the great eastern universities and a member of a prominent firm of corporation lawyers. Her mother is a beautiful woman who is very concerned with her personal appearance. Her current bill at the beauty salon would pay the food cost for Jane's family for a month.

Jill's relationship with her mother is complicated and a constant source of anxiety and bewilderment for Jill. Sometimes her mother will smother her with affection, telling Jill that she is all that is left in the world for her. A short time later she may be screaming at her, criticizing her for almost anything: her appearance, her manners, her schoolwork. Sometimes when she has had too many cocktails she launches on a diatribe against her former husband, shouting to Jill over and over what a worthless, unfaithful monster he is. On a number of these occasions Jill has put her hands over her ears and run screaming to lock herself in her bedroom.

Jill's mother goes out a great deal in the evening with various men. Sometimes when a man is to call for her mother Jill is required to dress up and present herself to the caller with her very best manners. Other times she is told to stay in her room until her mother and her escort have gone. Jill's internal response to all these men is a corrosive hatred.

For about a year Jill has flatly refused to have anyone stay with her when her mother went out at night. After a few protests, her mother shrugged her shoulders and said that if Jill preferred to stay alone she could do so. Usually her mother does not return until the early hours of the morning. Sometimes Jill sleeps and sometimes she lies awake and stares at the night light, afraid of the dark but too terrified to get up and switch on the lights. After a late party her mother stays in bed all morning and Jill, if she is to go to school, must get up alone and get herself off, for the maid does not come in until ten o'clock. Her mother tells her to make her own breakfast but there is usually little time for that and Jill will drink some milk—or eat nothing at all.

In accordance with the terms of the divorce decree, Jill spends alternate weekends with her father. On Friday he picks her up after school hours in front of the apartment building, for he refuses to enter his former wife's apartment. He is a handsome man, cultivated and urbane. He is solicitous of Jill, takes her shopping, buys her expensive clothes, takes her to the theater or the movies or the zoo. He tells her constantly that he will get her whatever she wants, but Jill somehow senses that what she really wants is something her father cannot give her. When her father brings her back to her mother's building on Sunday afternoon Jill sometimes is vaguely aware that he does it with a sense of relief. After Jill has been with her father for a weekend her mother will scarcely speak to her for several days, except for some sharp order or reprimand.

For two years Jill has suffered periodically from blinding headaches. Sometimes she has had to come home from school, whereupon her mother or the maid gives her some aspirin and puts her to bed until the attack subsides. Her mother has taken her to various medical specialists, none of whom as ever found any physical basis for the headaches. Usually the interviews have ended with the physician suggesting that the malady may be psychological in origin and that Jill perhaps should be seen by a psychologist or psychiatrist. On these occasions her mother turns on one of her icy rages and tells the doctor there is evidently nothing wrong with Jill and that she will outgrow these headaches the same way she herself did when she was a girl.

At school Jill's work is erratic. Sometimes it is very good and sometimes worse than nothing. Once when Jill's teacher finally was able to get her mother to come to school for a conference, she told her mother that all the evidence she had showed that Jill was among the brightest children in the class and that there must be something that kept Jill from achieving at the level she presumably could reach.

At this, Jill's mother flew into a fit of temper, telling the teacher in no uncertain terms that if the school had some standards and if the teaching were any good Jill would not have difficulty. Then she told the teacher that when Jill finishes the sixth grade she will go away to boarding school—to the same school the mother attended as a young girl. The responsibility of the Maxwell School, she said, is to see that Jill's grades are high enough for admission to the boarding school.

Jill's relations with her teacher are remote. She never talks to the teacher if she can avoid it. Perhaps this is nothing surprising, for Jill apparently does not trust anyone—especially adults. Among the children she is known as a snob. One day a classmate, after some altercation, called her a "stuck-up snot." Jill fell on her, screaming and scratching, and the teacher had difficulty prying them apart.

That afternoon Jill had to go home with a splitting headache. She did not return to school for three days.

So here is Jill. She is a child of affluence and impressive ancestral background. In all her life she has never lacked for money. In fact, money is such a common commodity in her life that she pays little attention to it. She has always lived in the midst of luxurious surroundings, yet Jill has sometimes gone to school without breakfast—something that has never happened to Jane who, by any standard Jill would understand, is a child of poverty. In the tenth year of her life, Jill is already wracked with psychosomatic illness. She does not have close ties with her parents. In truth, she does not have close ties with anyone. The prospect she sees before her is that of her mother's life: fashionable boarding school, fashionable college, parties, expensive clothes, and always impossible expectations. Jill does not know what she wants. She does not understand any of it very well. But she does not find it a good life.

For observation

THIS IS JEROME

Finally, here is Jerome. Jerome lives in the south corner of the Maxwell District in an area that, if not already a slum, has practically deteriorated to that condition. He lives on the first floor of a large frame house that once was a substantial residence but which now is slipping into a stage of decay and disintegration. The paint is peeling, the floors sag, and some of the window panes have been replaced with pieces of plywood and wallboard.

Jerome lives with his mother and five siblings; a brother and a sister are older than he, and two sisters and a brother are younger. His mother works in a factory and is gone from early in the morning until late afternoon five days a week. In addition to her wages from the factory, his mother receives financial aid for her dependent children from the welfare agency.

Jerome has never seen his father, although he has vague recollections of a man who came and lived in the house for a time and then disappeared. He used to ask his mother about his father—who he was, where he was, why he wasn't at home. The only answer he got was that his father was dead, probably, or something and Jerome should go outside and play. Jerome doesn't ask any more.

The second floor of the house is occupied by Jerome's aunt and uncle and their four children. His uncle is a construction laborer and frequently out of work. His aunt works as a domestic servant for two families on the other side of town. The uncle drinks a good deal, particularly when he is unemployed, and sometimes when he has had too much he will beat any child who happens to be handy. This behavior is the cause of many squabbles and brawls between the two families. Jerome remembers once when his mother chased his uncle up the stairs with a kitchen knife and threatened to kill him if he ever laid a hand on one of her children again. Jerome has learned to stay out of the house on his uncle's bad days.

The whole establishment is in a perpetual state of uproar and confusion. Thirteen people are living in quarters that would accommodate six in reasonable

decency. Jerome shares a bed with two brothers but often in warm weather he will sleep on a quilt on the floor. There is no privacy anywhere. Usually two or three people are yelling; the television sets upstairs and down are going full blast. There is no place in which Jerome can do his homework, but then Jerome never tries to do any homework anyway. This got him in trouble with his third-grade teacher, who was a stickler for regulations. Periodically she wrote curt notes to Jerome's mother about his poor performance at school. Usually Jerome did not even take the notes home, but when he did his mother put them aside saying she would read them when she found her glasses.

Jerome's reputation at school is fast becoming notorious. The cumulative record that will follow him through school is already fat with accounts of his misbehavior, his truancy, his aggressiveness, and his poor academic record. The third-grade teacher would have retained him, but she could not bear the thought of another year with Jerome and the teacher of the other third grade flatly refused to take him. His name is on a list of those children who are to be screened for special attention of some kind, but the list is long and the school system's provision for special services is still embryonic.

In his tenth year of life Jerome is already known to the police. He and another boy were picked up after they had shot out ten street lights with home-made slingshots. The juvenile officer who handled the case threatened to see that Jerome was "sent up" if he was ever caught doing such a thing again. A few weeks later he and the same boy shot out a bank of windows in the Maxwell School, but they were not caught that time.

Jerome has run away from home on two occasions. The first time his brother found him sleeping in an abandoned shed after he had been gone two nights. The second time he came back of his own accord after being away for two days and a night. Both times his mother thrashed him but he would not tell where he had been or why he had gone.

And so, here is Jerome. He has known what it is to go hungry. He has never experienced security, financial or otherwise. The only really close ties he has ever had are with his mother, but these are already disintegrating. There has never been a masculine figure in his life that he could identify with or emulate. The only man in his life is the uncle whom Jerome hates with such vehemence that he has recurring fantasies about killing him.

Jerome lives only from one day to the next, trying to get enough to eat, trying to escape punishment at school and at home, fighting those he knows he can beat, and avoiding those he is afraid of. If he looked ahead, he would not see much of anything before him. But then, Jerome doesn't look ahead.

The impact of individual differences

These four children are in the same grade, in the same building, with the same teacher. All of them are within the normal range of intelligence. Some of them are brighter than others but none can be classed as mentally retarded. These children will all be provided with a common learning experience. Do they all present the same kind of teaching problem?

This question is not intended to be rhetorical. We saw in Chapter 3 that

development is always a function of the interplay between genetic factors and the environmental conditions under which this genetic potential develops. An individual's concept of himself is learned and this learning is a consequence not only of some underlying potential, but also of personal experience which is always unique and, in important respects, private.

We can be certain that the genetic inheritance of the four children is different. But we can also see that the environmental conditions affecting them are different. We have already considered how insufficiencies in the environment can stunt and pervert the growth process. "Deprived" and "disadvantaged" are popular terms these days in the social sciences, including psychology and education. But there are different ways of being deprived and disadvantaged, and the cases of these children present instructive evidence about the meaning of deprivation.

Jill and Jerome are both genuinely disadvantaged children. Both of them are undergoing severe deprivation. In some respects their deprivation is similar and in others it is different. In the case of Jerome, part of the difficulty traces to the extreme poverty into which he was born and from which escape is difficult. Lack of money has often deprived Jerome of even ordinary creature comforts. It has made a secure, decent family life impossible, and out of this comes much of the psychological deprivation—lack of strong family ties, absence of a father-figure,² and an outlook of hopelessness.

Jill has never known economic deprivation, yet her family life is not much better than Jerome's, although of course it is different in many important respects. Jill is about as deprived of real affection and security as Jerome is. She scarcely knows her father, although she spends alternate weekends with him. Her mother is hardly a model for identification. The prospect Jill sees for herself is as bleak for her as Jerome's is for him. They inhabit different worlds yet, unless conditions change, both of them probably are trapped.

Jane has always experienced economic deprivation, and money is a basic source of anxiety for her. Yet, in spite of the family's straitened economic condition, they have managed to maintain a reasonably secure relationship. In this sense, Jane is not nearly as deprived as Jill. However, Jane's experiential horizons, unlike those of Jill, are severely limited. Her knowledge of the world about her is meager. Although she is reasonably dutiful about her school work, much that Jane encounters in school really relates to little or nothing in her life.

Not many American elementary-school children are as fortunate as Joe and only a relatively small number are as deprived as Jerome. Yet, in any classroom there is always the chance that these extremes will be found. Even within the middle group the variation can be enormous. This is a fact that the teacher cannot escape. The real question is how well the teacher is prepared to face it.

Some teachers attempt to ignore such differences—at least they think they do. They take the hard line, holding that the school has a good program for those who want to profit from it and if some do not want to take advantage of it, that is just too bad. The business of the teacher is to *teach*, they say, not to do welfare work or provide psychotherapy.

But these teachers really are not ignoring the differences. They give low

²The importance of identification in the socialization of the child and in the formation of the self-concept is discussed by Rae Carlson in "Identity and Personality Structure in Preadolescents" (*Journal of Abnormal and Social Psychology*, 1963, 67, 566–573).

marks, they coerce, they threaten, they retain children in a grade to punish them for their poor achievement, they badger parents because their children do their homework poorly or not at all. They give "gold stars" and "black marks" and anything else they can think of to stimulate children to "get up to grade level." Their major concern is to standardize achievement (which really means standardizing growth) and the cross they bear throughout their lives is their inability to do it. How much damage these people do is a speculative matter, but it surely must be extensive.

There are other teachers, and we may hope they are in the majority, who understand the impact of these many kinds of differences. They are aware, with differing degrees of clarity, that while they must carry on their work in a group context, the educational program is aimed at individuals, not the group. Such teachers would be sensitive to the sparse experiential background of a child like Jane. They would make every effort to relate new material to each child's experiences however limited. And they would take account of what the extensive background of a child like Joe could mean in planning for *his* educational program.



The wideness of a child's horizons has a great deal to do with the amount of meaning he is able to attach to school experiences. If a child has traveled extensively and participated in the planning of family vacations, so that he comes to school with a first-hand knowledge of such concepts as "mountain," "cattle ranch," "Mount Vernon," "Mississippi river," he will have a far better appreciation of what is going on in his social studies class than will the child to whom these things are nothing but words on a printed page.

But things are never simple. Some things the informed and sensitive teacher can do and do well, but there are always the Jills and the Jeromes. These children present problems so complex that they are outside the competence of a teacher to handle alone. Yet these children are in school and the teacher sees more of them than anyone else does. Jerome became a future dropout in the first grade, although the law will try to keep him in school until he is sixteen. Jill may well be headed for profound psychoneurotic illness, but the teacher is not a psychiatrist. When we add to these children those who are handicapped by low intelligence, yet who are not far enough below the norm to be placed in special classes or other facilities, the dimensions of the teacher's problem become impressive indeed.

To an increasing extent, provisions are being made for helping children who present unusual problems, but the extent of this varies a good deal from one locality to another. Even when we have reached a much higher level of assistance than we now have, the task of the teacher will still be what it has always been—to plan educational programs that are suited to widely differing children. To do this, the teacher must not only be aware of the existence of differences among children—something he can hardly miss—but he must also have professional knowledge of the origin of these differences and the impact of the developmental process on educational practice. We will now consider some of the significant elements involved.

THE SELF-CONCEPT

Many psychologists believe that the way in which an individual conceives of himself is the single most important factor in his personality structure. The degree of self-esteem that he possesses goes far in determining how he will behave under various kinds of circumstances, what his level of aspiration will be, and what happiness and contentment he will enjoy in the course of his life.

We have seen that the child's concept of himself is an emergent of the process of experience and involves both physical and environmental factors. Some of these factors are inherited, and therefore presumably outside the possibility of manipulation. On the other hand, many of the environmental factors are capable of being changed to some degree.

The way in which an individual conceives of himself is a highly complicated thing. One important aspect is concerned with the kinds and degrees of ability that he possesses. In this connection, psychologists usually mention such attributes as good health, physical strength and skill (particularly in the case of boys), attractive appearance, and intelligence. These may be assessed by common observation—something we all do—and most of them may be assessed with more precision through the use of various instruments of measurement. In our society possession of attributes of this kind tends to be rewarded and, conversely, the individual who does not possess them to any significant degree is at a disadvantage. Among the four children we considered earlier in this chapter, Joe possesses these attributes to a high degree and none of the others is entirely lacking in them, though Jerome perhaps is at the bottom of the list.

We must remember, however, that actually being well and strong, physically attractive, good at games, intelligent, and so on is very far from being the whole of the story. The point is that it is not only whether the person has these in terms of

some objective criterion but also *whether he perceives himself as having them* – whether his perception of himself is realistic.

Jill provides an instructive example of the disparity between reality and self-conception. Jill is intelligent, one of the brightest in the class, but she thinks of herself as “dumb.” Much of this estimate of herself may be lodged at the door of her mother, but Jill also has had some teachers who contributed their share.

Jill is an unusually attractive child, but her own estimate is that she is ugly. She thinks her nose is too long, her hair stringy and not the right color, and so on. Here again the influence of her family background is evident: her mother’s constant nagging about her appearance; her father’s telling her bluntly that he will buy her some new clothes so she will look better. And so Jill, who shows every evidence of becoming the beauty her mother is, is going through life convinced that she is, in her own words, “just hideous.”

There are many forces that play on the elementary-school child and influence his self-concept. Since we are concerned here primarily with the school experience of the child, we will take note of two important elements in the school situation that are decisive in the formulation of a child’s conception of himself. One of these is the teacher’s influence; the other is the influence of peers. There is always an interaction of course: a child with a strong self-concept may influence others so that they tend to rate him as he rates himself; by the same token a self-demeaning child invites others to treat him like a doormat and usually has his invitation accepted.

There is evidence to suggest that whether a teacher likes having a given child in his class goes a long way in determining how the child sees himself. It is true that wise teachers attempt to conceal their likes and dislikes of individual children, but it probably is never possible for a teacher to conceal entirely how he feels about a child. This means that there is a certain amount of unintended communication which, while it may be exceedingly subtle, may be all the more powerful for its subtlety.

This poses a difficult problem for the sensitive, informed, and conscientious teacher. His head tells him that it is important for him to be accepting of *all* the children in his class, but in the case of some children his heart finds the task difficult. Jerome, for example, is a child whom any teacher will find difficult to accept, for there is a wide discrepancy between Jerome’s attitudes and preferences and those of his teachers. Jerome is, among other things, impulsive, defiant, unsystematic – but, given the role they must play, his teachers place a premium on orderliness, obedience, and cooperation. The result is, of course, a high level of dissonance and it is hardly a mystery that Jerome has been rejected by every teacher he has ever had. The point is that this rejection has left its indelible mark on Jerome and on the way he thinks of himself.

About the same thing can be said concerning the effect of peer relationships on the self-concept. Here the impact is usually clearer and more direct, for preadolescents as a rule make no attempt to mask their feelings about their associates. For example, Joe is one of the most admired children in his class. He is a leader, but not pushy. He is good at games. He has a fairly even disposition for a nine-year-old. Joe has many things going for him.

But consider the other three children. Jane is viewed by most of her classmates as a nothing – “just blah.” Jane knows this and has known it for a long time. She is increasingly withdrawn and timid except in the company of a few

children whom she considers to be her own kind. Jane thinks of herself as "just blah." Her teachers have thought that, too, but they usually have tried to conceal it—with varying degrees of success.

Jill presents an unusual and exceedingly pathetic case. On the surface it might seem that Jill has a very great deal going for her: ability, money, family, social prestige, bright future. But Jill is known among the other girls as "that stuck-up bitch." They would never, of course, let their parents or their teacher know they used such language, but Jill got the message long ago. And how are we to estimate the impact of this on a nine-year-old?

The question of how far the school can expect to improve the self-concept of a child cannot be given a categorical answer. The situation is too complex. There are too many variables. Much experience indicates that a thoughtful and concerned teacher can have influence not only on a child directly, but also on the child's peer relationships. It is only realistic, however, to recognize that there are limits beyond which a teacher's influence cannot go. A child's concept of himself is a function of his total experience, not just that of his experience in school, and beyond the limits of the school setting there is much that no teacher can control.³

ENERGY AS A RESOURCE

This is a time of exuberance and energy. The healthy child has an excess of animal spirits. He operates on a fund of physical energy easily released and quickly renewed. This energy is a great resource for learning. Frequently he does not know when he is tired, when he has had enough. He will keep going all day and far into the night unless someone stops him. His work and play are never done, and he may feel that adults are not sufficiently impressed by the importance of things he must accomplish.

Sometimes the child's energy makes him see desirable behavior in a different light from the adult. Put ten children at one end of a hall and ask them to go to the other end. Nine of the ten will run or skip or hop—anything but walk. Most of them will slow down if asked to by an adult, but in a short time they will be running again. To them it is the best way to get where they are going.

The child is noisy and boisterous. He cannot understand why adults object to his whooping and laughter and particularly to the sounds he makes to imitate machines: the roar of a car, the whine of a jet plane, the chatter of a machine gun, or the spit of a cowboy's forty-five.

Growing muscles demand motion

Muscles and bones are developing rapidly during this period. The child's strength almost doubles although his growth in size is slower. Large muscles beg to be flexed and stretched.

³An important report on research in the development of the self-concept is to be found in *In Pursuit of Self-Esteem*, by Pauline S. Sears and Vivian S. Sherman (Belmont, Cal.: Wadsworth, 1964). In addition to a discussion of research methodology, the book contains elaborate reports of eight case studies of elementary-age children. See also Chapter 10 of *Child Psychology* by A. T. Jersild (6th ed., Englewood Cliffs, N.J.: Prentice-Hall, 1968) and Chapter 6 of *Children: Behavior and Development*, by B. R. McCandless (New York: Holt, Rinehart & Winston, 1967).

Is it any wonder that the child becomes restless if he is required to sit still for long periods of time? Even though he might like to behave as he is expected to, his body demands activity.

In an elementary classroom filled with children, the room itself teems with restrained movement. Chairs creak. Pencils drop. Feet scuffle. The teacher asks for quiet. A wise boy goes to sharpen his pencil, obtaining a whole chain of motor release. On the way back to his seat he swings playfully at two or three children and kicks at a foot in the aisle.

The child is usually willing to abide by reasonable rules and requests about the proper place for noisy and boisterous behavior. But his memory is short, and his energy can be triggered by the slightest pressure. He needs frequent reminders. These should be a gentle brake, not a nagging apron string to bind the child hand and foot.

The child's body needs motor release, not once or twice a week during the gym period, but frequently. After discharging his energy, he can be quiet for a time. A school program paced to offset quiet periods with periods of activity gives him a chance to let off steam.



Energy can be put to work

Wise channeling of the child's impulsive energy can be put to work for learning. The boy and girl in this age group learn better when they are active. Arithmetic has more meaning to the child who can feel objects and move them about. Ideas are absorbed more readily when the child has materials to handle and to work with.

As the child's neuromuscular system matures, there is a steady gain in coordination. Gradually eyes, hands, fingers, body posture, and feet come to work together in closer and closer harmony. The child who at five cannot catch a ball when it rebounds from the floor and whose throwing motions are awkward and inefficient can at eight or nine play a fair game of catch or even a game of basketball.

If the child's physical system has not matured to the point where he can master a skill, exercise or training will not hurry the job. The teacher will do well to keep this in mind. Physical activities in the school program should mesh with the child's stage of development.

As the child becomes ready, he will learn from other boys and girls the skills necessary for ordinary games. He will learn to throw and catch, jump rope, turn cartwheels, ride a two-wheeled bike, handle simple tools, and develop other skills appreciated and admired by his playmates.

Failure to achieve the appropriate skills brings indifference or disdain from age-mates. Success here is more important to a boy than to a girl. A girl can do poorly at games and still hold status among her playmates. But a boy who does poorly is inclined to be looked upon as a "sissy." In school the awkward child can be helped by being grouped with playmates of similar physical prowess so he can learn at his own rate.

The child finds real satisfaction in his growing bodily control, for control enhances his sense of adequacy. During this period he needs to build wholesome attitudes toward his body and to develop habits of body care and cleanliness. The school can help him do this by teaching health habits as a routine part of living.

CURIOSITY AS A RESOURCE

Another great resource for learning in middle childhood is intense intellectual curiosity. The child of this age wants to know everything, go everywhere, and do everything. He is intrigued with the work of adults and likes to tag after his mother and father and other adults as they go about their daily tasks. He asks question after question. He manipulates everything he can get his hands on. He has not yet acquired the adolescent desire to give the impression of sophistication and wordly wisdom.

His sense organs, perceptual powers, and motor skills have developed to the point where he is ready to absorb facts, put them together in his mind, and gain insights. Printed words are related to spoken words. Fingers at six can print readable letters and become more and more adept as the child grows older. Time and space and other concepts begin to be real.

The world of fantasy is a consuming interest, particularly in the early part of this period. The child's fantasy life is rich and varied. Even before he is able to

read for himself, he projects himself into the stories read to him by others. He identifies easily with the characters and situations he encounters in radio and television programs, in comic books, and in the movies.

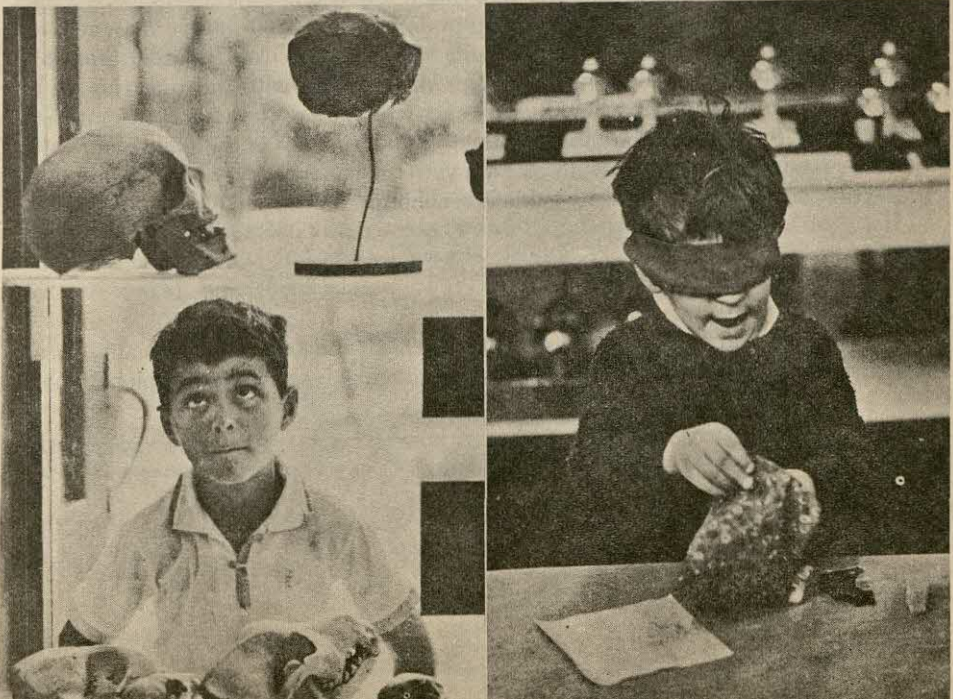
At six he is not sure about what is real and what is not. He may ask many times whether fairies are real, whether God is real, whether giants are "really real." His questions are earnest and important to him and require judicious answers. As he grows older, he begins to get reality straightened out, although he may keep up a pretense of the Santa Claus or Easter bunny myths long after he knows better, probably because they have pleasant associations for him.

Some of the child's interests are practical and concrete. He is a builder. He likes all kinds of materials with which he can make things: wood, nails, tools, paper, paste, paint, metal, and other equipment of this nature. Many times he can work out and express his ideas better through concrete materials than he can verbally. He is a great collector, too. He will collect match covers, postage stamps, spiders, stones, pieces of string, snakes, trading cards, paper dolls. These things he collects become identified with himself, almost a part of himself.

He learns through his interests

Much of the child's learning comes from his activities. As he builds and collects, as he asks his numerous questions, as he observes the world about him, he learns to interpret and use his natural and social environment. His learning can be rich and varied if his environment affords contact with many natural and social processes, if materials for designing and building are available, and if adults in his orbit are sympathetic and helpful.

The child's endless curiosity about the world around him is one of the greatest assets the teacher can draw upon. It can serve as a starting point for classroom study, for an independent project, or for outside reading. The teacher can also help youngsters learn to use their senses more fully in exploring the world. Exercises in which the child practices identifying objects by sound or by touch help him learn to notice things around him.



He can get the most out of school instruction if it is related to the things he knows, the things he does, and the things he is interested in. Unless these relationships are brought out, instruction may have little meaning for him.⁴

It is interesting to find out what values elementary-school children have. One study showed that while there are age differences, boys during these years tend to place friendship, excitement, recreation, and family life at the top of their value list. Privacy, power, and recognition are rated low. Girls put highest value on friendship, family life, excitement, and recreation, with physical freedom, recognition, and power rated low (Hawkes, 1952). These, of course, are statements of conscious values. But they do suggest something about the involvements a child feels in his own world.

If school experience is too formal or is not related to the child's outside world, it becomes isolated experience, giving no meaning to his out-of-school behavior. A youngster of this age can be amazingly resistant to learning material in which he finds no real interest. And what he does learn may be quickly forgotten if it has no meaning or obvious use to him.

Most elementary-school children can find great intrinsic interest in many of the areas commonly studied in school. For example, if the different social studies areas are well presented, the child will like them because they are interesting in and of themselves. He does not quibble over whether or not he will be able to make more money as an adult because he is learning about Eskimos or the Congo. He simply finds Eskimos and the Congo interesting.

Surface curiosity needs drawing out

Curiosity at this period is often surface curiosity. The child continually samples his environment. He wants to know only what he wants to know. Say he finds a bug. He is proud of his discovery; he shows it to others. He uses a stem of grass to turn it over. He prods it. Its legs kick. Its mandibles move. Now he may put it in a box, squash it, or let it go.

Taking this surface interest and weaving it into a unified experience is a part of good teaching. The child's attention span depends on his interest in an activity. He is capable of sustained attention and will work on real interests for long periods of time. With a little encouragement, the child with the bug can be intrigued into finding out whether the bug eats wheat or prefers his mother's roses and what its habits are. Too often we fail to make full use of the child's curiosity.

To sustain native curiosity, to blend it with the school program, to deepen it to the extent of the child's capacity—this is teaching.

The child should lead the way

There is more and more for the child to learn all the time. His education is an acculturation to a complex, ever changing heritage. The school is the place where

⁴The Reading at the end of this chapter is a report on the changing interests of preadolescent youngsters.

much of his knowledge and many of his skills and concepts are learned. The important thing for the teacher to remember in helping the child to acquire them is that children are different at different ages, and within each age group they differ.

One five-year-old may become impatient with kindergarten activities because he is ready to learn to read. Another child may not be ready to grasp the rudiments of reading until he is eight. To force a child to learn skills before he is ready can lead to frustration and intense dislike for the subject. But holding a child back when he is ready can be harmful too. Insofar as possible, the child should lead the way, with the teacher encouraging him in all ways to use his capacity to the fullest extent.

Curiosity about sex is natural

Not until later childhood, from ten to twelve, do sex differences become pronounced. Even so, interest in sex is present in most children throughout the elementary grades. It is as natural for a child to be interested in his own body as it is for him to be interested in what causes lightning and what makes it snow. Where do babies come from, he wants to know. Why are boys and girls different? Why does Mother behave in one way and Father in another?

Adults find this curiosity more difficult to handle than the child's curiosity about other natural processes. Cultural taboos hedge sex and sexual relationships in our society. As a result, adults are often reluctant to give straightforward answers to questions about sex. The child senses this reluctance and the embarrassment often accompanying discussions of sex. He is quite aware of the insufficiency of many of the answers. Many children of this age get no answers at all to their questions, and in some homes they are criticized and punished for asking. All this combines to leave the child with a strong impression that sex is "bad."

Those who have studied the problem usually urge that basic understanding of the physiological aspects of sex be achieved before adolescence. The preadolescent interest in sex is somewhat different from that of the adolescent. It can be more objective and matter-of-fact, for sex does not have the enormous emotional charge in these years that it does during adolescence.⁵

The role of the school in developing fundamental understandings and attitudes about sex is not likely to be settled for some time. We can be sure, however, that curiosity about sex and the accumulation of some kind of sex information will always occur among our growing children. The initial sex interests of children are not morbid or indecent. The child of this period is concerned with manliness and womanliness more than with maleness and femaleness in the sexual sense. If his interests become morbid or indecent, it is due to failure of adults to provide wholesome learning experiences.⁶

⁵For a discussion of the role of sex in the life of the elementary-school child, see "Sexual Behavior Among Preadolescents" (*Journal of Social Issues*, 1966, 22, 6-21).

⁶Sex education is discussed in "Helping Children Grow Up Sexually," by E. B. Luckey (*Children*, 1967, 14, 130-135), and "The Pedagogy of Sex," by W. Simon and J. W. Gagnon (*Saturday Review*, November 18, 1967, pp. 74-76, 94).

PLAY IS IMPORTANT

Play is as important in the life of a child in the middle years as are food, clothing, and shelter. The child plays from inner necessity. His social, intellectual, and emotional growth find expression in his play activities. He plays hard and works at playing.

Play helps the child to work off excess energy. It gives his growing muscles the stretching and flexing they call for. It allows him to exercise his creative bent. It helps him along the road to personal independence from his parents. It helps him learn to get along with age-mates. Through identification it helps him learn his social role. It teaches him the attitudes toward social groups and institutions that he will need to acquire for democratic living.

Before the child enters school, the number of his companions is limited. At school he meets many new playmates. He finds himself wanting their friendship and approval. To win them he soon realizes he must learn to share games and toys, to take turns, to give and take.

Make-believe games persist for the boy and girl throughout middle childhood. One day, one year, he is a cowboy and she is a nurse. Another day, another year, he is Captain Space and she is a princess.

A child's dramatic play can serve a very useful purpose for him. Many times it helps him to work out his unconscious conflicts. An adult who is disliked can be identified with the villain and brought to a just retribution. A child deeply frustrated by his inability to compete socially or physically with his playmates can become a great hero, sweeping all opposition before him in his imagination. Play is an outlet for his feelings and is helpful as long as he realizes where his fantasies end and the realities of his personality and environment begin.

Many adults have a deep-seated uneasiness about the play of middle childhood. They see it as too bloody, too rowdy, and too noisy. They feel that children allowed to play with toys and guns in mock war may have a more-than-ordinary chance of becoming delinquent. Yet common observation as well as the insights furnished by psychiatry indicate that dramatic play is the natural activity of children throughout the world.⁷

As the child becomes older, he becomes more and more interested in organized games and cooperative play. Children will get together for a game of hide-and-seek, to produce a show in the back yard, to build a playhouse. By later childhood there are well-marked differences in the play activities of boys and girls, probably due in large part to folkways as to what is proper for each sex. But sex differences are not so pronounced that boys and girls cannot play such games as baseball, basketball, and volleyball together with great enthusiasm.

In later childhood the national sports of baseball and football dominate the interests of many a boy. He plays them incessantly, saving his allowance to buy equipment, collecting pictures of outstanding players, and identifying himself with the stars. Girls at this age work out problems of home and family in their play.

The eight-year-old strives for companionship in whatever he does. By nine he

⁷Erik Erikson presents an excellent discussion of children's play in "Toys and Reason," Chapter 6 of his *Childhood and Society* (New York: Norton, 1963). A study of children's play activities, emphasizing the ways play can foster healthy personality development, is presented in *Understanding Children's Play*, by R. E. Hartley, L. K. Frank, and R. M. Goldenson (New York: Columbia University Press, 1952).

wants to ensure this companionship and becomes extremely interested in various organized groups in the community. These are further steps along the way to consolidating a place for himself in the world away from home and arriving at personal independence from his parents.

The gang fills a vital need

To break away from adult dominance becomes more and more imperative as the child reaches nine and ten. And he seeks to fill this need through *the gang* as a natural and inevitable part of growing up.

Gang activity of middle childhood takes many outward forms, but the basic characteristics are common. Members are usually of one sex. The gang is exclusive in membership. There is always an "in" group and an "out" group. There is rivalry with other gangs. Each gang tries to be secret or to have secrets not divulged to other gangs and certainly never to adults. Whenever possible, each gang has its "secret" meeting place. Membership tends to be unstable, however. Members may be expelled and new ones added, although a fairly common core of membership may be maintained.

The difficulties the gang age presents to adults are related largely to supervision and the clash of child and adult values. Standards of the gang may affect the behavior of its members more than the standards of adult society. Much of the allegiance that previously went to the family tends to be claimed by the gang.

This movement into the gang and away from the home is a source of anxiety for the child. Allegiance to parents, shared by teachers, is in some sense replaced by allegiance to the gang leader. Adult authority is rejected both in the home and in the school.

But in the family the child knew where he stood. There was certainty and, in this, some security. He knew the code of behavior expected of him. As he makes the transition to the gang, he loses this safe certainty. The gang is new. It asks him to defy the old authorities. He has no sure pattern and not even a guaranteed place. He may sometimes find himself left out. This is a new threat to his self-esteem.

The child's mass identification with those of his own age may frighten his parents as they feel their control loosening. The child who has always confided in them and depended upon them begins to keep his affairs to himself. He questions their policies and decisions and judges them in terms of the values of the gang. In some cases, such behavior may cause families to reduce the amount of affection they have ordinarily shown, probably as a defense reaction. Sometimes parents tend to tighten their authority, but such action serves only to increase the child's defiance.

It is a rare parent who has not encountered negative behavior on the part of children in middle childhood. Negativism toward adult authority and social convention is not unique to this period. But it is often resented more in a nine-year-old than in a younger child. "He is old enough," adults say, "to know better."

Adult supervision of childhood gangs is difficult, because any intrusion on the secret character of the organization is strongly resented. Yet adults cannot afford to abdicate their responsibilities altogether. They must keep an eye on gang

activities if the youngsters' group bravado is not to get out of hand. They must be alert without becoming "nosey." If they can set reasonable limits and give the child freedom to carry on his natural activities within those limits, both they and the child will feel more secure.⁸

Gangs are neighborhood affairs, but their social effects often spill over into the school situation. The gang's exclusiveness of membership and constant rejection of some children complicates integration of the classroom group.

A sense of adventure permeating this period of childhood is part of the process of growing toward maturity. The child expresses a growing need for independence from adults through his desire to explore the unknown, to take chances, and to prove himself to the gang.

He reinforces his feeling of self-adequacy by seeking thrills and coping single-handed with the dangers involved. As he grows, he challenges himself and tries out his new powers. He wants to know how brave he is and to prove to himself that he is not afraid. The insecure child may go to extremes and drive himself into dangerous situations.

Organized groups fill a need, too

It has often been suggested that the gang spirit can be diverted to better channels of expression through clubs and organizations sponsored by schools and community groups. But adult-sponsored clubs never completely fill the need of the gang age to "go it alone."

The organized group serves a very important purpose, however. Children of this age love to belong to groups other than their own intimate gang. In these groups they learn many of the skills and techniques of group life. Here is the adult's chance to see that such learnings are wholesome. If the child learns ethical behavior in an organized group under good adult supervision, chances are he can be trusted to be guided by it when he is away from adults.

Since the child tends to outdo himself in adventurous activities, lack of supervision can result in real danger. Adults can help to satisfy this need for adventure without indulging in overprotection. The best course to follow is to provide activities that furnish a thrill yet are safe for children of this period. For the younger child, apparatus for climbing and doing stunts is safer than trees, rocks, ditches, and abandoned houses. For the older child, camping, fishing, and hiking are reasonably safe and still provide a thrill. Camping fulfills the child's desire to explore strange places, to hear strange noises and smell strange smells, to feel the thrill of sitting around a campfire with deep blackness all around. This is real living for the normal child of nine or ten.

PATTERNS OF DEVELOPMENT

In the years preceding puberty all children go through the same general sequence of development. The slow but steady rate of physical growth that began in early

⁸Suggestions for handling the problem of childhood gangs will be found in *Your Children and Their Gangs*, by Edith G. Neisser and Nina Ridenour (Washington, D.C.: Government Printing Office, 1960).

childhood continues. There is an increase in coordination and the child gains in manipulative ability. This growing power is expressed in complex organized games and more sophisticated use of art and craft materials.

There are also marked gains in conceptual orientation. Children in this period make much more use of abstractions embodied in verbal and mathematical symbols. There is somewhat less need for direct learning experience and more dependence on vicarious experience.

The process of identification and role-taking which began earlier in the child's life continues. The presence of suitable figures for identification now becomes crucial in the socialization process.

The peer group assumes increasing importance and typically the child begins to experience the conflict between the values and desires of his parents and the ways of the gang. There is a firmer grasp of value concepts and a growing awareness of what is fair and what is unjust, but this moral awareness often is complicated by discrepancies between parental and peer-group values.

Although all boys and girls go through these stages, the *rate* at which they go through them varies. These individual differences have an important impact on the work of the teacher.

Boys and girls mature differently

Boys and girls differ in their rates of growth. This is particularly true in late childhood when girls mature more rapidly than boys. This difference in growth greatly influences school achievement and adjustment.

In all of the usual areas of school learning girls, as a group, are more successful. They have fewer reading problems than boys. Their social adjustment tends to be more rapid, making them easier to control in school situations.

By the later elementary grades, girls may be biologically ahead of boys the same age by as much as two to four years. It is natural that their school achievement and social adjustment should be generally advanced over those of boys in the same school grade.

To hold the girls up as examples for performance or behavior in such a way that the boys as a group are deprecated can contribute to unwholesome attitudes that may carry through life. It is possible that some girls will adopt a superior attitude toward the male sex and that some boys will come to feel inferior and resentful as the result of such handling. For the same reason, when individuals are singled out for praise, care must be taken to praise the person as an individual rather than as a boy or as a girl.

Care also should be taken to avoid comparing a child unfavorably with an older brother or sister whom the teacher has had in previous years. Sometimes undesirable behavior in the schoolroom may be caused by unwise treatment of such a situation in the home.

When parents hold before a child the superior record of an older brother or sister in the same grade, hoping to shame him into better school achievement, the child may feel guilty of failure, rejected by his parents, and resentful toward the older brother or sister.

In the case of a girl who is compared to an older brother, resentment against

the opposite sex may continue into her later life and make it difficult for her to develop a positive attitude toward marriage.

The same may be true of a boy who is compared to an older sister. His resentment against her may be transferred to females in general, and especially to all women teachers. Since women make up the bulk of elementary-school faculties, the boy may feel he lives in a feminine world, and he may strike out against it with aggressive or rebellious activity.

Sometimes they slip back

In general, children of middle childhood, like Joe, progress steadily ahead to increasing maturity. But sometimes they slip back to behavior patterns more appropriate to an earlier age level. This is known as regression.

Probably the children most apt to regress are those who feel insecure. But secure children may regress too, when placed under conditions of strain. Such situations include extreme fatigue, hunger or other organic stress, fear or uncertainty, severe frustration, temporary feelings of rejection.

A frequent example is the behavior exhibited by some children when a new brother or sister is born. The older child, feeling that his own status is threatened or destroyed by the new arrival, regresses to a lower level of behavior. He may begin to suck his thumb, a habit discarded long before. He may wet his bed at night or fly into violent temper tantrums at the slightest provocation. In extreme cases he may actually try to do physical violence to the new baby.

A good many psychological explanations for regression have been evolved. For parents and teachers, the problem is how to handle such cases. The child must be understood within his perspective of the situation. Corrective measures must help him to feel more secure and more capable if they are to be successful. Punishment may serve only to reinforce the regression.

To prevent regressive behavior from developing out of the school situation, teachers should not constantly confront children with learning tasks or other situations beyond their ability. To ask more of a child than he can achieve creates frustration. Both parents and teachers should remember that continued and severe frustration of any kind inevitably brings one or both of those twin devils of human behavior—aggression and regression.

UNDERSTANDING EASES THE WAY

And so Joe and Jane and the other boys and girls will make their way through middle childhood, sometimes forging ahead with confidence, sometimes slowly feeling the way or even trying to turn back for a time. As they advance, they will need increasing opportunities for independence, responsibility for planning and follow-through, and self-evaluation.

The child has a long way to go in breaking away from dependency and establishing the relative independence of adult life. The process of breaking away will occur with or without parents' and teachers' approval. It is part of the pattern of growing up.

How much better, then, that the child should have sympathy and understanding and wise guidance while this process is going on. He needs above all to feel that he is a solid part of the family group and has their trust. A child can learn to manage his own affairs wisely only by long experience. He can learn more quickly and more soundly under good guidance. The home and the school provide the best opportunities for such guidance.

The child who meets the requirements of this period reasonably well and who feels happy with his achievements will be rewarded with a feeling of self-adequacy. He knows he can stand on his own two feet with a degree of independence. He has a fair conscience structure, a set of values. And this feeling of self-adequacy is extremely important to the child who stands at the brink of adolescence.

Reading

Joseph C. Bledsoe and Iva D. Brown

THE INTERESTS OF PREADOLESCENTS: A LONGITUDINAL STUDY

The preadolescent is going through a period of rapid change in his emotional life and his social relationships. His interests and activities are changing, too, as he leaves childhood and takes the first tentative steps toward adulthood. To chart the progress of this latter change, the authors of this selection have studied the interests of a group of boys and girls at the fourth-, sixth-, and eighth-grade levels. Their findings should be of considerable interest to prospective teachers.

Much attention has been devoted to the assessment of the interests, especially the vocational interests, of adolescents and adults. Although some writers (Pressey, Robinson, and Horrocks, 1959) have stressed the importance of the preadolescent years in the genesis and etiology of interests, much less attention has been devoted to the measurement and evaluation of interests of children in the late elementary and junior high-school years.

The fact that such interests are in a state of flux during this developmental period, accompanied by a lack of verbal sophistication on the part of some persons at this stage, perhaps explains the relative paucity of such measurement. It would appear, however, that more definite knowledge of the interests or preferred activities of typical children at this time (ages nine to about fourteen) would be of considerable value to both elementary and junior high-school teachers and to parents in understanding these pupils.

The present study is a report of the measurement of the interests of a sample

of pupils on two occasions, two years apart in time with a comparison of interests of children at three grade levels.

Statement of the problem

This is a survey of the interests of samples of preadolescent children for the purpose of:

1. Observing changes in interest of preadolescent boys and girls as they advance in school.
2. Comparing the interests of preadolescent boys with the interests of preadolescent girls.
3. Identifying activity preferences of preadolescent boys and girls.
4. Showing correlations in interests for selected broad areas for both boys and girls as revealed on two occasions, two years apart in time. Specifically, correlations between interest scales for fourth-grade (1961) and sixth-grade (1963), and for sixth-grade (1961) and eighth-grade (1963) groups are reported. . . .

Procedures

The subjects selected for this study were pupils enrolled in the fourth and sixth grades in four Clarke County, Georgia elementary schools during the school year 1960-61. The Clarke County School District was chosen as a fairly typical example of school districts of Georgia and perhaps of the southeastern United States. Clarke County is 125 square miles in area, and has an estimated 1963 population of 50,000. The Clarke County School District includes 18 schools, which in 1963 had a total enrollment of approximately 9,500 pupils. From the 18 schools in the system, four schools were chosen to represent a cross section of the population.

An interest inventory, *What I Like To Do*, was administered to pupils enrolled in the fourth and sixth grades in the four selected schools, and a repeated measurement was made two years later. A total of 605 pupils was tested in 1961, but of this number only 392 were available in the sixth and eighth grades in the same school district for the 1963 testing. This group on whom repeated measures were taken comprise the sample for this study.

The testing instrument, *What I Like To Do*, prepared by Louis P. Thorpe, Charles E. Meyers, and Marcella Ryser Bonsall, is an inventory of children's interests in eight important areas: art, music, social studies, active play, quiet play, manual arts, home arts, and science. Both in-school and out-of-school activity preferences are surveyed by the instrument and an interest pattern for each child may be secured in the eight areas. The score for each area was a simple frequency count of the number of items in each scale to which the pupil responded "yes". The number of items ranged from 28 for manual arts to 63 for science, with a total of 294 items in the eight scales. A "total interest" score was obtained by adding the values for the eight separate scales.

This interest inventory was standardized on a national basis by grade and sex. A sample of 800 cases from the national norm sample was selected for studying the reliability of each of the eight interest areas. Coefficients of reliability were com-

puted for both boys and girls. These coefficients ranged from .702 to .972, indicating a satisfactory reliability.

Analysis of data

For convenience and economy in the presentation of the data, the subjects were grouped as follows:

Group A6	Sixth-grade boys tested in 1963
Group A4	The boys of Group A6 when tested on the fourth-grade level in 1961
Group B6	Sixth-grade girls tested in 1963
Group B4	The girls of Group B6 when tested on the fourth-grade level in 1961
Group C8	Eighth-grade boys tested in 1963
Group C6	The boys of Group C8 when tested on the sixth-grade level in 1961
Group D8	Eighth-grade girls tested in 1963
Group D6	The girls of Group D8 when tested on the sixth-grade level in 1961

Individual profile charts were prepared for purposes of group discussion with the pupils and for comparison with the subjects of the national norm groups. Group profile charts were then prepared for comparison of each group with the national norms. In the interest of conserving space, these profiles are not shown. Analysis of the profiles revealed, however, that groups A4, A6, B4, B6, and C6 corresponded closely with the national norms, indicating a slightly greater interest in most of the areas represented by the scales. Sixth-grade girls in Group D6 showed generally below their counterparts in the norm group and slightly below the sixth-grade girls in group B6. Although the interest inventory was purported to be for pupils from eight to fourteen years of age, and most of the eighth graders were thirteen or fourteen at the time of administration, no norms were available in the test manual for eighth-grade boys and girls. A comparison of the responses of the A6 and B6 (1963) and C6 and D6 (1961) revealed a close similarity in response for the two groups. The manual arts scale showed identical percentages of "yes" responses for the two groups and the widest disparity was in the scales of art and music, a difference of ten percent in both instances. . . .

For boys measured in the fourth and sixth grades, no significant differences in interests were obtained. The girls when in the fourth grade showed significantly higher interest in social studies, quiet play, manual arts, home arts, science, and total interest than when measured in the sixth grade.

On repeated measurements in the sixth and eighth grades, boys at the sixth-grade level showed a significantly higher interest in art, music, social studies, quiet play, manual arts, home arts, science, and total interest than they revealed at the eighth-grade level. Only in interest in active play was there no significant change for this group.

Similar patterns were noted for girls measured at these two grade levels. When measured at the sixth-grade level, girls revealed significantly higher interests in

quiet play, manual arts, science, and total interests than when evaluated at the eighth-grade level. A suggested tentative inference is that the significantly lower interest scores displayed by both eighth-grade groups are primarily a function of development. A concomitant of increased age and experience may have been increased sophistication and less naivete and curiosity. Experiences gained during this two-year interval may have provided opportunities for the boys and girls to satisfy many of their specific curiosities. Thus, what appear to be a lowering of interests at the eighth-grade level may simply be a maturing of interests. The instrument selected for assessing interests perhaps did not provide adequately for the sharpened or crystallized interests which may be more characteristic of the older groups.

... At fourth-, sixth-, and eighth-grade levels, girls were significantly more interested in art, music, and home arts than were boys. At all grade levels tested, boys were significantly more interested than girls in active play. Boys liked manual arts more than girls, except at the fourth-grade level. Sixth-grade boys in the 1963 group were significantly more interested in science and social studies than the sixth-grade girls. The direction of the differences for the sixth-grade groups in the 1961 testing was the same, with boys liking these areas more than girls, but the difference was not large enough for statistical significance. . . .

A tabulation of the responses to the individual items included in the inventory made possible the identification of the ten items which ranked highest in preference for each of the groups as classified by sex and grade. (The responses for the two sixth-grade groups were combined for this tabulation.) The ten activities most frequently liked by fourth-, sixth-, and eighth-grade boys and girls are listed in decreasing order of frequency in Table 1. At least five of the ten items identified for each group were from the active play scale (i.e., go camping, go fishing, etc.). A difference in the types of play activities rated most interesting may be observed with grade level advancement. At the fourth-grade level, the play activities of boys most liked were individual play activities usually non-competitive in nature (swimming, shooting targets, fishing, etc.) whereas at the sixth-grade level competitive sports appeared and subsequently retained their popularity at the eighth-grade level. Playing baseball did not appear at the fourth-grade level for boys, was second choice at the sixth-grade level, and dropped out of the first ten choices at the eighth-grade level; whereas football, which did not appear at the fourth-grade level, rose from ninth choice to second choice from the sixth to the eighth grade. Interest was also shown in competitive sports by the eighth-grade girls.

Activities with an element of novelty in which children have had few opportunities to participate usually have considerable appeal, as evidenced by the interest shown by children of both sexes in such items as sledding in the snow, building things out of snow, and ice skating, which for Georgia children are relatively rare experiences.

Sex differences in particular preferences in activities are readily observable from study of Table 1. At the fourth- and sixth-grade levels, a number of items from the home arts scale were rated high by the girls. In contrast, boys preferred items from the science and social studies scales. Particularly noteworthy perhaps is the item "see a display of weapons used many years ago", which boys at all three grade levels included, but which was not included among the top ten activities preferred by any of the groups of girls. By way of contrast, girls seemed to prefer

going to movies and taking care of pet animals. At all grade levels girls seemed to like quiet play activities relatively more than boys.

A tabulation of the responses indicating the highest frequency of "no" or negative responses revealed pronounced sex differences. For boys, the items which were least interesting activities were playing with paper dolls, dancing in a ballet, playing house or school, taking dancing lessons, and activities perhaps perceived by them as "girl-type" activities. Girls responded "no" most frequently to

TABLE 1: ACTIVITIES MOST PREFERRED BY BOYS AND GIRLS IN DECREASING ORDER OF PREFERENCE

Boys	Girls
<i>Fourth Grade</i>	
1. Go camping	1. Make candy or ice cream
2. Go swimming	2. Go swimming
3. Go bike riding	3. Go to movies
4. Go hunting	4. Go bike riding
5. Go fishing	5. See the kinds of money used all over the world
6. Shoot at targets	6. Go sledding in the snow
7. Hear about life in the jungles	7. Take care of a pet animal
8. See a display of old weapons	8. Bake cakes, pies, or cookies
9. Find out about animals that lived thousands of years ago	9. Build things out of snow
10. Explore caves	10. Roller skate
<i>Sixth Grade</i>	
1. Go swimming	1. Go swimming
2. Play baseball	2. Play table games like "Monopoly"
3. Shoot at targets	3. Ride horseback
4. Go hunting	4. Take care of a pet animal
5. Go camping	5. Go to movies
6. Go fishing	6. Build things out of snow
7. Go sledding in the snow	7. Go bike riding
8. Take care of a pet animal	8. Bake cakes, pies, or cookies
9. See a display of old weapons	9. Arrange the furniture in your room
10. Go to movies	10. Ice skate
<i>Eighth Grade</i>	
1. Go swimming	1. Go to movies
2. Play football	2. Listen to popular music on the radio
3. Go hunting	3. Go bike riding
4. Go to movies	4. Go swimming
5. Go bike riding	5. Take pictures with a camera
6. See a display of old weapons	6. Play basketball
7. Play volleyball	7. Play table games like "Monopoly"
8. Ride horseback	8. Go sledding in the snow
9. Go camping	9. Build things out of snow
10. Go fishing	10. Play volleyball

the following activities: "box or wrestle", "build model trains", "play cowboys or space men", "flip jackknives", "build a radio set", and "play football".

In view of the general tendency for pupils to check fewer activities as liked, as they advanced from fourth to sixth and sixth to eighth grades, a tabulation of items which showed a percentage *increase* of ten or more percentage points at these grade levels, two grades apart, seemed pertinent. These items are shown in decreasing order of magnitude in Table 2. Among activities which increased in interest for both boys and girls and at both grade levels were listening to popular

TABLE 2: ACTIVITIES SHOWING AN INCREASE IN PREFERENCE OF TEN PERCENT OR MORE WITH GRADE LEVEL ADVANCEMENT (Items are presented in the order of magnitude of decreasing interest)

Fourth – Sixth Grades	Sixth – Eighth Grades
<i>Boys</i>	
Make artificial fruit out of wax	Play volleyball†
Play with a yo-yo	Grind and polish stones for jewelry
Visit a prison to see how it is run	Make a piece of jewelry out of metal†
Go to concert†	Draw unusual designs
Make lamp shades	Print with carved linoleum on wood blocks*
Listen to popular music on the radio*†	Listen to popular music on the radio*†
Play tennis*†	Hammer designs on copper trays or plates
Make maps	Play tennis*
Make artificial flowers out of paper and wire	
Design posters†	
Print with carved linoleum or wood blocks*	
<i>Girls</i>	
Design posters†	Go sledding in the snow
Listen to popular music on the radio*†	Play basketball*
Play football*	Listen to popular music on the radio*†
Shoot at targets	Play volleyball†
Play with a yo-yo†	Belong to a club*
Play basketball	Wash the car
Design new clothes*	Visit a prison to see how it is run
Mix paints to make different colors	Design new clothes*
Collect phonograph records*	Sing while you are working or playing
Belong to a club*	Listen to stories on the radio or watch stories on TV
Play ping-pong	Play football*
Play tennis†	Make a piece of jewelry out of metal†
Go to a concert†	Paint walls, or a floor, or furniture
Grind and polish stones for jewelry	Do stunts on bars or on a mat
Make leather things—such as wallets, belts	Listen to news programs on the radio
	Make party decorations
	Collect phonograph records*
	Go to movies
	Learn about how people of all races and religions can get along better

*Increases shown at both grade level advancements

†Increase in interest shown for both sexes

music on the radio, and playing tennis. Increases shown by boys at both grade levels included printing with carved linoleum or wood blocks. Girls at both grade levels increased in preference for playing football, playing basketball, belonging to a club, and collecting phonograph records. Besides interest increases evident at both grade level advancements, as boys and girls moved from the fourth to the sixth grades they increased in preference for designing posters, while from the sixth to eighth grade, both sexes increased their preferences for playing volleyball, and making a piece of jewelry out of metal. . . .

Summary

A comparison of the interests of boys and girls at three grade levels (fourth, sixth, and eighth) has been made. A total of 392 pupils in a southeastern city, tested at the fourth- and sixth-grade levels in 1961, were retested at the sixth- and eighth-grade levels in 1963 on the "What I Like to Do" Interest Inventory. Decreasing interest in activities at higher grade levels was interpreted more as a maturing and crystallizing of interests than as a decrease in interests *per se*. Sex differences indicated that girls were significantly more interested in art, music, and home arts than boys, with boys expressing greater preference for manual arts and active play. Specific activities preferred most by boys and girls at each grade level were identified, as well as activities which showed an increase of ten percentage points or more in preference. . . . The findings should have value for teachers and parents of pre-adolescents in understanding this level of development.

ADOLESCENTS

Some wag has called ours a two-stage culture: adolescence and old age with nothing in between. Advertisements suggest it is sometimes impossible to tell which is the mother and which the daughter. With all the attention paid to adolescents in our society, it may seem strange that we find this age group so difficult to understand.¹ But there are reasons for this, as we shall see, and it is interesting to find that it is true in every country where the modern urban culture flourishes, from Canada to South America and from England to Russia.

Adults have many problems with adolescents. Parents often are fearful of what their adolescent youngsters may do and are at wit's end when it comes to managing them. Some have given up; many are indulgent; others react with strictness. Sometimes school authorities find a solution in many ironclad rules, a police officer permanently assigned to the school, and exclusion of those who do not conform. The community worries over youth riots and delinquency. Although the sexual revolution is prevalent among adults as well as teen-agers, attention is focused on the freedom practiced by youth. Thrill seeking and wild automobile driving get wide newspaper coverage; surveys are conducted to find out about glue sniffing or "pot" parties and LSD use. Graduation drinking parties are the bane of some communities.

Another important fact about this generation, often overlooked, is the teen-ager as an economic force. Whole industries and advertising designs focus on teen-age fads. Many earn money, but this age group spends far more than it earns on entertainment, records, cosmetics, food, and clothes, to say nothing of automobiles.

¹An excellent source of information on all aspects of adolescence is *Understanding Adolescents: Current Developments in Adolescent Psychology*, by J. F. Adams (Boston: Allyn & Bacon, 1968). A classic presentation of the subject is *Theory and Problems of Adolescent Development* by D. P. Ausubel (New York: Grune & Stratton, 1954).

AGE-LEVEL SNAPSHOTS

We shall begin our study of adolescents with a few glimpses of the world as it looks to the eyes of high-school pupils. A sensitive English teacher who knows how to make writing count for adolescents had students keep journals. Excerpts from some of these are presented below:

"A child observes so differently from the adult. It's not merely the proverbial innocence which is the missing factor in adults. I think it's because children want to learn and let nothing stop them from knowing the whole truth. No matter what it may show them. I can feel myself rejecting former childlike thoughts for other not-so-satisfying adult thoughts.

"War cannot be justified. War happens because killing is the only sure method as well as permanent way of one human silencing another. Expanded it silences a nation. Societal conflicts in this respect could be likewise simplified to the conflicts between two people. (Maybe). If one person kills another he is punished. Thus if one nation wars on another it should be punished?"

"What is right and what is wrong? This problem sears my mind. Does it depend on the individual and the society? Many feel so. Is there a basic right for all men? (Maybe)."

"Is there a supreme being, a 'God'? I, myself, do not know whether any divinity exists (figuratively). However, I truly hope one does. It is a comforting thought to feel that I am not being watched and regulated . . . but I am. But why would such an obviously powerful Being want to, or be capable of, overseeing the whole earth out of billions . . . an infinite number of planets, stars, and galaxies! Why should my humble achievements and hopes and prayers be of any consequence or concern to Him?"

"Each man must search his innermost thoughts and decide what he believes in, for without faith in something—be it the power to reason, man, or God,—man's existence is nothing. If man does not have something in which to believe, he does not have something for which to live."

"Last night the ----- Club went caroling at the ----- County Hospital. Our goal was to spread Christmas cheer and joy. At the County Hospital I felt out of place and very false. The patients were disturbed and many ignored us completely. It was those who loved and enjoyed us that bothered me the most. Their lives in that hospital were far from being complete. How did such a happy and healthy group appear to them? Didn't we seem strange and a bit foreign? I felt as though I had no right to tell these people to rejoice when we would leave so soon, and the halls

would be quiet once more. Singing was not enough. We simply went, took our music, and said Merry Christmas, and left."

"It is so nice to come in out of the cold, with your cheeks all rosy, and warm up by a nice blazing fire with a cup of hot chocolate. Then, when you are all warm and snug, you can look out the window at the snow falling from the sky and gently settling on the ground."

"I have often wondered and considered what I will become in the future. But it all seems so remote, and my efforts now are not concentrated. I get almost impatient waiting for the years to pass as if wishing to look in a crystal ball to see what is to become of me. School seems so hopeless and I feel as if I am accomplishing less and less. The pace is so rapid. Why can't we slow down?"

"In reading *Walden*, I find many ideas that I have thought of, but not in as much depth, of course, as they have been discussed in class. I find it interesting that an entire work containing views that aren't complimentary to his society or to mankind in general has been considered among the great American works."

"Today I'm depressed. I suppose my misery is because of all the problems, assignments, and such other things hanging over my head. With all I must do there seems to be no time to accomplish anything. The worst thing is that the duties never seem to end. I suppose life must be this way, though, for if there are no problems, no miseries, then how can one know happiness?"

"The inside of me is so sensitive but if someone would ask me, why? how? and why didn't you laugh then? or say thank you now? I could only tell them to shut up. When they laugh at me and call me strange, how can they expect me to see them in any different light? Is their way of life and set of values any better just because there are more of them?"

"It is strange the way so many people are concerned for everyone else. I'm not concerned for anyone, they must live their own lives. I wish they would let me live mine. They would call that hard-hearted but can't they see how much more narrow their own attitude is? When they ask if I'm lonely, why I don't eat lunch, or say that religious instruction is good for me; they are imposing their own values on me. I wouldn't try to do that. Just because I like music and candles doesn't mean anyone else in the world should, doesn't mean I should take it upon myself to educate them to the "values" of what I have found. Why are people so blind?"

"It seems so strange to me that schools, colleges, ask again and again—what are your marks? How many did you get right? Shouldn't they rather say—what do you think? What are you interested in? Not what grades did you get, but what conclusions in your thinking did you come

to? We are making a nation of cranberry glop, not of men. No, not us, them—the machine.”

“i want to be free. i hate everyone all the sudden. i am all melted wax, hot wax that no one can touch to form because . . . because . . . i’m not free and i hate school and all the kids and.”

“How many times have I found myself completely rejecting, rejecting, rejecting? I reject without evaluating. At times, I am almost looking for bad. Some people I just cannot seem to accept. Or, I find myself wondering why I must accept them. People whom I have only seen, I reject without giving a fair evaluation.”

“I came upon a friend, though not a close one, in school today. He was coming from one direction and I the other as we met at the foot of a stairway. Pausing for just an instant, we faced each other in silence and then he proceeded up the stairs before me. Not a word or sign of recognition had passed between us. Each of us, as if unwilling to take the first action, had waited for the other to speak and then parted without a word. As soon as we had separated, I wished that I had said something, but, of course, the opportunity was past.”

“Played with John for an hour without yelling. Did not finish homework. Too bad. It’s more important to live than to study. Being with my brother is just as educational as reading Thoreau.”

“ . . . I often wonder what kind of things happen to people that cause them to become completely altered. Perhaps, I’m being naive and perhaps that I cannot see why is due to the fact that I myself am undergoing a complete change. I am aware, very totally aware of it, for I’m the one who is partially causing the change. I see what I want to be and I’m working on my mind to become this ideal, sort of brainwashing myself. I realize that my prejudices, attitudes and feelings are, but I must understand them before I can do anything about them. That is why the (my) self always comes first. It is more important to satisfy myself, examine myself, and understand myself, for how can I ever hope to truly understand people, life or anything without knowing my OWN self first? . . . ”

“It is foggy today. I love fog—it seems to put a magical spell on the world. Harsh outlines are soft. Night lights are dim. Quiet surrounds the city. I can find so little quiet in so few places.”

“I spent my time enjoying the obvious appeal of advertisements to the ‘snob’ in the American character. It was unbelievable to see the abundance of examples:

‘Will your gift be the most expensively made?’

‘A beautiful place to be seen and seen at.’

‘If you perked up when you turned to this page, our research

computer says you're probably well-informed, earn above average income and have more or less "in-type tastes." "

It would of course be a great mistake to think that teen-agers, any more than adults, spend every moment in deep contemplation, but it is interesting that, in less sophisticated form, boys in an institution for delinquents wrote many similar thoughts in their journals. If we were to read teen-agers' diaries, rather than their journals, we would doubtless find a heavy emphasis on cars, on exciting times. But wonder about the meaning of life, preoccupation with the self, reflections on the past childhood, worry over the future, and aloneness are the substrata of the age period.²

This is an age of many and diverse concerns. We are rightly appalled when we read of a band of genius-level high-school students who rob to get money for their secret laboratories, just as we are appalled when we hear of juveniles murdering "for kicks." It is easier to remember these terrible events than the positive aspects which get little publicity. Teen-agers volunteer their services in hospitals. Many hold part-time jobs. The vast majority are exciting to teach and appreciative of help. Their interests range from intensely personal reflections to the broadest aspects of our culture—from war to poverty. They are responsive to beauty and sensitive to the arts. In a sort of hyperthyroid way, they reflect the culture which produced them; they provide a sharp image of both its promise and its failures.³

PHYSICAL ASPECTS OF ADOLESCENCE

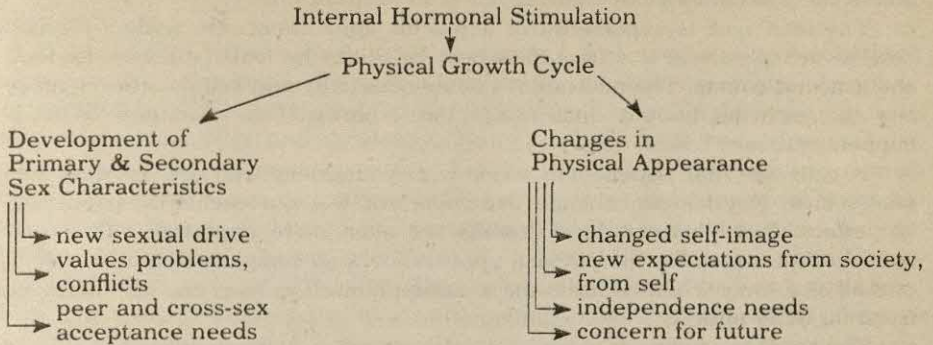
Adolescence is first of all a physiological phenomenon. Internal body hormones activate a complicated growth cycle. Ausubel (1954) delineates three levels of changes, each triggered by the preceding one (the original activator being genetically regulated). At the first level is the increased secretion of sex- and growth-stimulating hormones by the pituitary gland. At the next level is the secretion of gonadal and adrenal hormones and the production of mature germ cells. Third are the physical changes brought about by the new hormonal secretions, including the maturing of the sex organs, the development of secondary sex characteristics, and changes in body size, strength, and proportion. There are also certain non-sexual changes in blood pressure and respiration. The sweat- and oil-producing glands become more active and are sources of increasing personal hygiene concern to adolescents. It is this series of interlocked changes, individually stylized for each youngster, that underlies the adolescent's changing picture of himself and his world.

The youth of today grow up faster and are taller and heavier than their predecessors. Boys reach puberty at about fourteen years of age, girls just before the age of thirteen—about two years earlier than their counterparts of fifty years

²Three books of interest are: *The Adolescent Experience*, by E. Douvan and J. Adelson (New York: Wiley, 1966); *The Experience of Adolescence*, by S. Golburgh (Cambridge, Mass.: Schenkman, 1965); and *The Universal Experience of Adolescence*, by N. Kiell (New York: International Universities Press, 1964).

³Today's teen generation is discussed in "The Rebellious Youth Sub-Culture—A Myth," by R. C. Bealer, F. K. Willits, and P. R. Maida (*Children*, 1964, 11, 43–49) and "The Stormy Decade: Fact or Fiction," by A. Bandura (*Psychology in the Schools*, 1964, 1, 224–231). The adolescent's role in American culture is re-evaluated by H. A. Otto and S. T. Otto in "A New Perspective of the Adolescent" (*Psychology in the Schools*, 1967, 4, 76–81). The Reading at the end of this chapter is a report of a survey of high-school students' attitudes toward school life and social responsibilities.

THE PHENOMENON OF ADOLESCENCE



ago. First comes growth in height, often followed by growth in weight. There is a filling out. At the same time, other changes are taking place. In the girl, the breasts develop, pubic hair appears, menstruation begins, the hips broaden, and the body takes on rounded female contours. In the boy, the testes and penis increase in size, pubic hair appears, the shoulders broaden, the voice deepens, and the beard begins to grow. Muscular development may spurt ahead. The strength of boys doubles from twelve to fifteen; that of girls increases much less.

Not all parts of the body grow at the same rate. Feet often seem too big, arms and legs too long. This unevenness of growth is considered by some experts to be the cause of awkwardness in the early teens. The adolescent, unusually sensitive and self-conscious anyway, tends to hold himself tensely and move in jerks. He drops things. He stumbles. And his clumsiness adds to his acute self-consciousness, making him more awkward than ever.

The teen-ager is uneven not only in his growth but in his activity. He zigzags from frenzied action to sluggishness. Adults are inclined to look upon the downswing of the cycle as laziness. Actually the ups and downs may be related to the unevenness of growth, to abrupt changes in mood, or to real fatigue. With growth taking place so rapidly, the adolescent often is just plain tired.

The time that adolescence comes has much to do with the particular adjustment each young person must make. Suppose Tom begins his growth spurt before any of his classmates. He is a short boy who begins to shoot up all of a sudden. He may grow as much as eight inches in two years or less. As he changes from a small boy to the largest in the group, his status within the group changes too. On the other hand, Tom's best friend Bob has a quite different experience. The same size as Tom at eleven, he gets his growth gradually, never changing his relative position in the group. The adjustments faced by the two boys will be quite different.

On the average, girls begin their adolescent development about a year and a half before boys. From the ages of eleven to fifteen girls tend to be heavier and taller than boys their own age. This places girls in a superior category and boys in an inferior category, purely because of size, and poses another obstacle to the social adjustment of both during the early teens.

Many adults consider themselves tall or short in relation to *when* they grew rather than how tall they actually have become. Ordinarily, the boy who grows early has an advantage over other boys. But the girl who grows rapidly at an early age hates being "too big" and may stoop in her attempt to reduce her height. She

thinks of herself as somehow "peculiar." This misconception may last for years unless she is skillfully guided during her growth spurt.

The teen-ager is supersensitive about his appearance. He seldom realizes how he actually looks to others. It is how he thinks he looks and how he feels about it that counts. The adolescent's acute sensitivity and self-awareness make any change in his body a small crisis. "Am I normal?" he wonders. "What is happening to me?"

It calls for real patience to work with youngsters who are growing into adolescence. Physiological changes are important. But to a teacher the psychological effects of adolescent developments are even more important.⁴ The early teen-ager's concern for his physical appearance is so complete that it overshadows all else. Only when he has come to accept himself as he is can his energy be freed for other outlets.

The teen-ager needs as much help as he can get in understanding and accepting his changed body. In working out a new picture of just who and what he is, it may help him to read the stories of other "selves" in biography and literature. Problems of growth can be discussed in the classroom. It should be made clear that it is normal for individuals to vary in their appearance and rate of development. Because teen-agers are so concerned with problems of growth, they can be motivated to study biology, health, diet, and the relation of outward appearance to sense of inner worth, if the material is handled with imagination.

With sexual growth comes only the physical part of sexual maturity. The ability to procreate is not the same as the appreciation of the responsibility one assumes in either an intimate relationship with another or the production of a new and helpless dependent being. Yet marriages are being made at a younger age: the average bride today is in her twentieth year.

Sex is no joke to the adolescent—even though he may joke about it. His feelings about sex are at the core of much of his behavior. Biologically he has reached sexual maturity. Emotionally he has not yet achieved the maturity of judgment that comes from a sense of security with himself and his world. This is not to imply that all adults respect the complications of sexual behavior in this society either, but the adolescent is more likely to be overwhelmed by them.

As the sex organs mature, there is increased capacity for sexual arousal. Dreams and daydreams show the responsiveness of the adolescent to sexual stimulation. There is a more specific sex urge to deal with than he has previously known. He is confronted with new desires for which he has no past pattern of behavior.

The problem is confused by multiplicity in standards of conduct. Sex is exploited in much of the literature he reads and in movies, TV, and advertising. The larger culture in which he lives appears to talk one way and act another way in its sex behavior. His "crowd" has its own ideas of what is acceptable behavior. While there is considerable difference between the sex mores of girls and of boys, these tend to be fairly stable within a social class level.

Young people try to solve this problem in a variety of ways. Some ignore the existence of a problem. Some rationalize by a "what everybody does" standard.

⁴Biological, psychological, and social aspects of adolescence are discussed by L. Eisenberg in "A Developmental Approach to Adolescence" (*Children*, 1965, 12, 131-135). P. Blos presents a psychoanalytic interpretation of adolescence in *On Adolescence* (New York: Free Press, 1965).

Some become very idealistic and try to live by compulsive and strict standards. Some learn to talk things over with adults and to look at tomorrow as well as the moment.

What is the school's role in sex education? While some schools have an innocuous course in family living or a few lectures on sexual problems, there are not many schools that have a full-fledged formal involvement in this topic that is so vital to the teen-ager and to society. Many attempts have been thwarted by parents or specific community groups. Yet the school often unwittingly provides the major source of sex education, for the peer culture is the major teacher and the school is the site of much peer interaction. While the formal educators, except perhaps for some counselors, are silent, the informal educators are busy. Codes are established and communicated. The sophisticated inform the less knowledgeable. The struggle to belong without participating in behavior which one does not personally accept produces tensions. There are the "ins" and the "outs." Many newspapers, TV programs, and magazines speak openly of normal and abnormal matters which are still taboo for school discussion. At the same time, adults are upset by the change in behavior of each younger generation.

"I wish you would tell me what I should do," is a frequent plea—spoken or unspoken—of the adolescent to his parents and his teachers. He needs controls and limitations, for in limits there is security. His need to feel grown up and mature will cause him to resist and defy controls, but without some restriction he is likely to lose his sense of balance. Without parents or teachers to help him draw the lines of desirable behavior, he may have a feeling that no one cares what he does and may react to this feeling with unrestrained behavior.

It seems high time that a reasonable educational dialogue be established between the generations and that the school, perhaps with the help of other community personnel, at least match the public channels of unmonitored information. This does not mean that the school should rush in without careful attention to individual differences. Appropriate content for one school might be too advanced or too elementary for another. But it is time we include more than the sex life of worms and frogs in biology courses. It is most important to note that the essence of sex education is not physiological education alone: it is the chance to explore related values and the opportunity to think through one's own position with the assistance of sympathetic, knowledgeable adults.

CHANGING SOCIAL RELATIONSHIPS

Now that the adolescent has undergone the physical changes that mark the end of childhood, he is suddenly "a different person." He no longer responds in the same old ways to those around him—and they can no longer respond in the same old ways to him.

The adolescent and his peers

The adolescent's changing person has a profound influence in the area of peer relationships. Young people need to identify with others of their own sex to

compare behavior and work out their role. It is important to be accepted as "one of the boys" if you are a boy, and "one of the girls" if you are a girl. But it is equally important to be attractive—or at least acceptable—to the opposite sex.

The boy who has been blissfully unaware of dirty hands and ears now spends hours combing his hair, taking baths, and experimenting with toilet articles. The girl who had to be reminded about her nails and the state of her hair becomes engrossed in primping before the mirror, manicuring her nails, and arranging her clothes. A boy or girl who has not made a mature adjustment to the social demands of preadolescence often can make real progress now because of the strong need for acceptance by the other sex.

Social adjustment in the early teens does not run smoothly. Girls, maturing a little earlier than boys, want the boys' interest before the boys are ready to give it. Sometimes a girl who fails to attract boys at this age becomes afraid that boys don't like her. She may react by "chasing after" them or using too much make-up and overdressing in the hope that this will make her more attractive. She needs help to understand that the lack of response is caused by the boys' immaturity and does not prove she is a failure socially.

The teen-ager has mixed feelings about affection. He wants to demonstrate what he feels inside when he is with people he likes. But his oversensitivity makes him uneasy about gestures of affection. The fear of being rebuffed or rejected often makes him hide his true feelings. Sometimes it is great enough to keep him from participating in social activities.

The first attempts at socializing are made through informal mixing—there is security in numbers. Next comes dating in groups and then pairing off. Once the adolescent has overcome his early uneasiness at dating, he loves being "in love." "Going steady" has become a custom of the high-school population in the United States as a form of guaranteed dating. Nobody wants to be left out.

Normally the boy-girl relationship wears itself out in a few weeks, and partners will switch to new steadies who will last another few weeks. A few may "go steady" throughout their entire high-school years. But rarely does a boy or girl marry his high-school steady.

The insecurity of adolescence gives rise to an intense need to belong, to be like everybody else. At this age it is "my crowd," "my gang," "my girl," "my steady." Out of this need grows a slavishness to the group.⁵ It shows up in fads of the moment—the way boys and girls dress, the way they wear their hair, the slang expressions they use, the place to go on a date, the drugstore hangout. The leaders set the pace, and to belong, the rest must follow. "But Mother, all the kids have one" is a frequent plaint.

The need to belong finds expression in several relationships. There are small, intimate in-groups or *cliques*. To be a part of a popular, operating clique in a school carries high prestige. Clique memberships are relatively stable.

A large amalgamation of youth is the *gang*. Its membership is fluid. The gang congregates at a favorite hangout which offers food, soft drinks, a juke box, and a place to dance. Here the teen-ager has an audience to show off to, a place to meet new people, and a feeling that he is part of the group.

⁵The adolescent's need to "belong" is discussed in *Reference Groups: Exploration into Conformity and Deviation of Adolescents*, by Muzafer and Carolyn Sherif (New York: Harper & Row, 1964).



The *organized school group* satisfies another part of this need. There are clubs and classes, homeroom groups, the student council. Special interests lead the teen-ager to join the radio hams, the glee club, the football team, the school paper. Special interest groups have kept many students in school.

The adolescent also enjoys the *crowd*. Assemblies where the whole school sings or cheers are considered fun. Pep rallies are exciting, and the mob at a game is thrilling. If there is a mob at the dance after the game, then that is the place to go, even if dancing is scarcely possible and friends are lost in a human sea. Young people often look to see if there is a crowd before they venture to pay the admission price.

The behavior exhibited by the adolescent is a reflection of his greatest needs as he grows into adulthood. Dating, going steady, being part of the gang, are all steps to becoming an adult among adults, to learning to get along with the same sex and the other sex, to looking upon girls as women and boys as men, to becoming ready for marriage and family life.

Close boy-girl relations and the sense of belonging to a group bolster the teen-ager's self-confidence and diminish his insecurity. To be with others who are going through the same experiences gives real emotional support. The adolescent has the protection of the group. His friends are eager to give him tips on "the thing to do" and "the thing to say." Comparing notes, they profit from each other's mistakes and successes. Conventional behavior of his age group has become so much the standard for the teen-ager that mothers no longer say, "When I was a girl I was not allowed . . ." Rather it is "What are the other girls or boys doing?"

Encouraging young companionship, and much of it, helps to keep dating and going steady on a wholesome basis. While this is first the responsibility of the parents, many times they do not see it that way. Some parents may forbid going

steady, others may forbid even dating, with the result that the boy and girl are driven further away from adult suggestion and direction. The success or failure of early experiences with the opposite sex often imprints a lasting self-image.

The school is a natural place for young people to find companionship. It probably provides the greatest opportunities for boys and girls to widen their circle of acquaintance. And here the socializing process that the adolescent desires so deeply can be advanced under guidance. Understanding teachers can help to keep adolescent friendships on a reasonable level. Dancing, skating, swimming, picnics, hobby groups, and other clubs are all ways in which the school can provide opportunities for boys and girls to have fun together.

Instruction in social skills, which many do not get at home, can be given indirectly and informally through the planning of parties, discussion of party behavior, the entertaining of outside guests in the school, the teaching of dancing. Socially backward boys and girls can be helped a great deal through special attention, if it is tactfully and unobtrusively given. Such help often brings about a great change in attitude when boys and girls ignorant of accepted social conventions learn how to behave. To know the right thing to do and how to do it creates self-confidence.

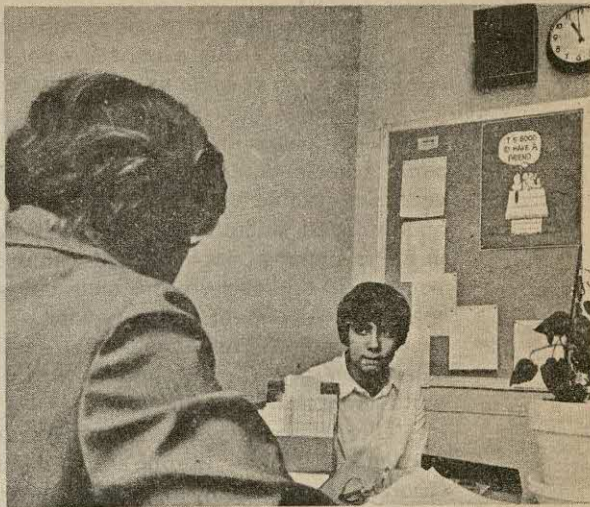
An unhappy backwash sometimes results from the teen-ager's great need to conform. He behaves as though he could not risk inclusion of anybody who is "different." A "different" boy or girl may be one who is overly intellectual, who thinks differently from the group and is not afraid to say so, who dresses differently, who has ideals too high or too low for the group to meet comfortably. Gulfs created by different social, racial, and economic backgrounds are especially noticeable.

The social structure in a class or school is often the most compelling part of an adolescent's "life space." It determines whether he is an "in" or an "out," whom he must please to be an "in," and what values he must hold to be approved by his age-mates.⁶ Teachers can help boys and girls to satisfy their social needs by encouraging them to join groups that will welcome them and to form friendships with other teen-agers who have similar interests. A teacher who is sufficiently kind and tactful may be able to help the outsider recognize and amend the characteristics that keep him apart. He can help the intolerant groups by his own example of tolerance and by teaching acceptance of others. He can make every effort to ensure that all members of the groups under his guidance are given the opportunity to participate fully. Too often most of the school clubs and activities are run by a few leaders who join everything. Whether the activity is a student government body or a drama club, democratic attitudes and principles can be fostered.

The adolescent and adults

The most provocative source of interaction with adults is of course the home. On the one hand, demands are higher because he is "practically an adult"; but at the

⁶The crucial importance of this "school within the school" is elaborated by J. S. Coleman in *Social Climates in High Schools* (Cooperative Research Monograph No. 4, U.S. Office of Education OE-33016, 1961).



Adolescents need sympathetic listeners. For the fortunate ones, part of this need is filled at home; the less fortunate must seek elsewhere. Those who teach in high schools should be prepared to listen, to understand, to offer comfort, advice, and acceptance as required, without being critical or dogmatic. The poster in the office of the teacher-counselor above says it all: "It's good to have a friend."

same time supervision is usually more intense because of the importance of his behavior now and the desire to prevent catastrophes.⁷ So he is in the position of being younger and older at the same time. "Why don't you act your age?" is coupled with "You are not old enough to stay out that late."

The conflict an adolescent feels with his parents frequently blocks easy communication with them about his problems. Still, he needs adult direction and understanding, and often he will turn to a teacher for it. That teacher then becomes a crucial person in the adolescent's world, offering one of his first and most vital adult relationships. The way the teacher responds can help or hinder the youth's social development and progress toward maturity.

The teacher is a figure for identification and imitation. His behavior, his attitudes, his practice as well as his "preaching"—all these are constantly being observed and evaluated. The adolescent learns from adults, not alone by what they say, but by how they live.

Being able to "talk it through" will help the adolescent more than anything else. This is not easy. Usually he is shy and reserved about the things closest to him. Sometimes he has to learn how to express his innermost feelings and to put into words what is bothering him. Nor is it always easy for the teacher to receive the young person's confidences, to be sensitive about his emotions, to feel free and easy with him, to draw him out. Sympathy and understanding are qualities which a teacher must cultivate.⁸

⁷A study of family and social factors in the lives of 13,000 high-school students is reported by B. M. Moore and W. H. Holtzman in *Tomorrow's Parents: A Study of Youth and Their Families* (Austin: University of Texas Press, 1965).

⁸The relationship between the teacher's personal needs and his ability to meet adolescent needs is discussed by G. R. Kaback in "An Examination of Teacher Reaction to Adolescent Needs" (*Education*, 1955, 76, 242-245).

Many schools now provide counseling service for all students, not only for the "problem cases." But whether or not there is a specialist available, all teachers are called upon at some time for advice or just to lend a sympathetic ear.

Sometimes the problems facing adolescents can be handled in a group situation.⁹ Classes in social living and personal adjustment now are being given in some schools. A variety of subject matter can be included in such a course, centering around the adolescent's needs as he sees them. Under the direction of an interested, skillful, and understanding teacher, such a class can be of real value in helping young people to deal with problems of self or of relations to others.

One of the most obvious characteristics of adolescence is ambivalence – wanting to be dependent and cared for as a child and at the same time wanting to be independent. The teacher often sees this vacillation even in the same pupil on subsequent days. "What should I write about?" on one day becomes "Do I have to write about that?" on the next.

The goal at this period is what Ausubel (1954) calls "executive independence," the sense of making up one's own mind about things, of having the power of decision. The adolescent may make the same decision his parents or his teachers would make, but *he* has made the decision, and that is the important thing. It gives him a sense of power and command over the environment. What this requires is shared decision making whenever possible. Teachers who work out their course requirements so as to offer as much choice as possible will enhance the feeling of independence.

But it goes deeper even than this, for there must be a new self-image to go with the new person. There are new questions to be answered: "Who am I?" and "Where am I going?" This is a time for exploring, for "trying on" new roles and the clothing and social activity that go with them.¹⁰ Seeking out others who "think the same way" helps to corroborate one's point of view.

Underneath all the external maneuvering lies the attempt to preserve self-esteem, and the adolescent has little capital to risk in this regard. While there are those who will work all the harder once they fail, a little failure goes a long way toward discouraging further effort. Rosenberg (1965) has pointed out that people tend to value most highly those things at which they are successful, and vice versa. Many youngsters learn quite early that school experiences are not a likely source of self-esteem, and adolescence may force a covert rejection of the school into the open.

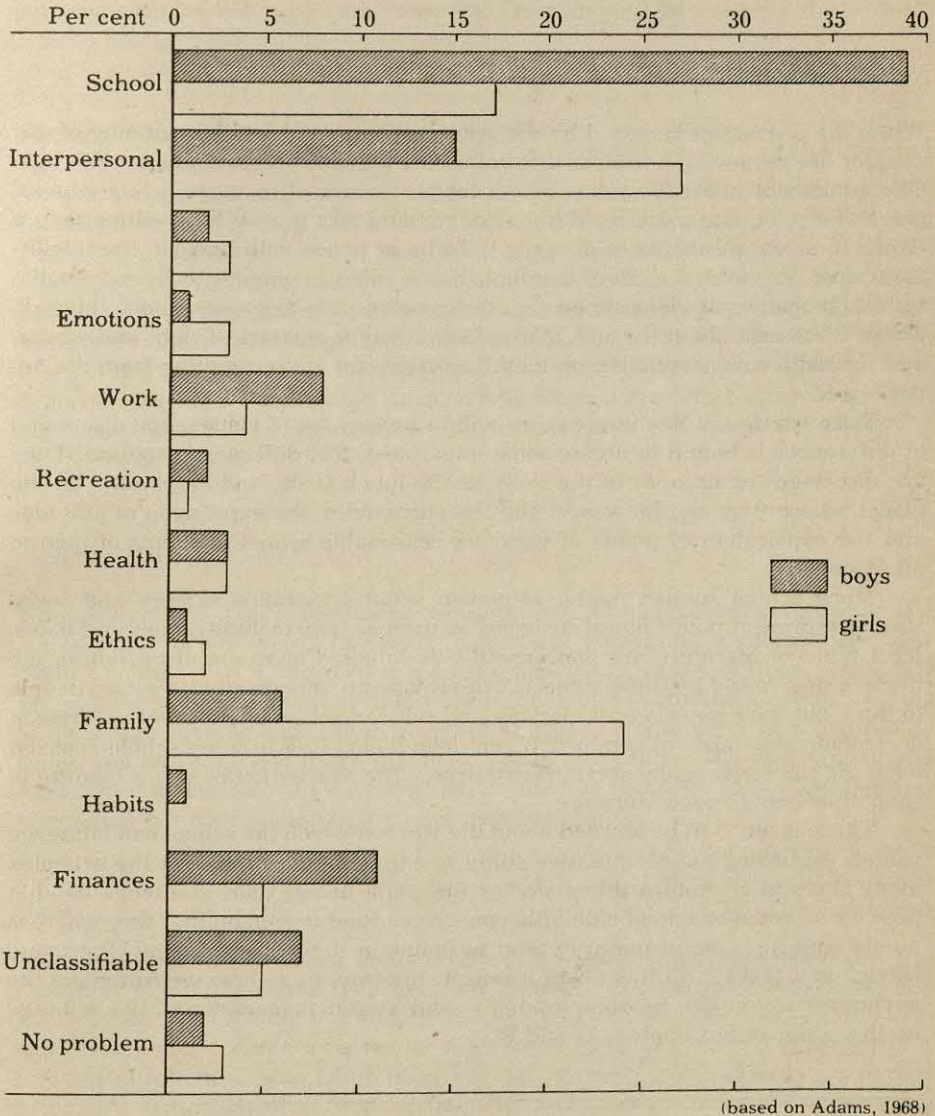
This brings us to the sensitivity which characterizes the adolescent. With so much on his mind, it is no wonder he is sensitive about his feelings and the ways in which others respond to him. If we do not take this into account, we are likely to misunderstand him completely.

⁹Problems common to adolescents are discussed in "Cross-Cultural Studies of Teenagers Problems," by H. H. Remmers (*Journal of Educational Psychology*, 1962, 53) and in "Identifying Problems of Adolescent Girls" (*Journal of Educational Research*, 1965, 58, 389-392).

¹⁰This aspect of adolescent development is discussed in "Youth's Dilemma: To Be or to Become," by E. G. Williamson (*Personnel and Guidance Journal*, 1967, 46, 173-177) and "Adolescents' Self-Perception of Personality Strengths," by H. A. Otto and S. L. Healy (*Journal of Human Relations*, 1966, 14, 483-491).

This sensitivity is not just on the surface. It is the overall insecurity which comes with a major change in status. Adults find it difficult to believe that under the oftentimes boisterous defensiveness is a sense of inadequacy and anxiety about the ability to measure up to one's goals. Even casual remarks may have a

PERSONAL PROBLEMS OF FIFTEEN-YEAR-OLDS



The graph shows the percentages of fifteen-year-old boys and girls reporting various types of personal problems. Note that most of the boys' problems are associated with school while those of the girls involve interpersonal relationships with family and others.

penetrating intensity. A teacher criticizes a composition and unthinkingly activates defeatism. A disciplinary procedure makes no allowance for the pupil's need for independence and is interpreted as harsh or as a sign that he is not trusted. One should not attempt to relate to adolescents casually. It is a tender age. Care must be taken in how one makes assignments, evaluates products, and requires conformity to external demands. The adult cannot abdicate the authority role, but he must exercise it with patience and insight.

VALUES AND IDENTITY

When the concerns expressed by the adolescents quoted at the beginning of this chapter are reviewed, it is clear that values are a major preoccupation at this age. The adolescent quest for values is not limited to sexual matters. It is a general search for adequate patterns of behavior ranging all the way from etiquette at a dance to a broad concept of integrity.¹¹ To be at peace with himself, the adolescent must arrive at a code of conduct that is realistic enough to be acceptable to his age-mates yet idealistic enough to be acceptable to society and to himself. There is concern about the self, a broad sensitivity to matters of right and wrong, and a need for substantiation of oneself as a person via recognition from the opposite sex.

Since we do not live in a culture with a unitary set of values, any discussion of differences is bound to create some uneasiness. Yet differences abound. They are discussed (or argued) in the halls, at the lunch table, and elsewhere. In the places where they can be woven into the curriculum, the expression of attitudes and the exploration of points of view are reasonable school functions of help to adolescents.

Much school subject matter is woven around morality. History and social studies represent man's moral struggles as truly as they include names and dates. Most types of literature are concerned with values. Classroom discussion of the moral issues raised by these subjects can provide an opportunity for young people to think out their questions of morality and self-control and help them to arrive at acceptable standards of conduct. When delinquents in a training school realized what the story was really about, Hawthorne's *The Scarlet Letter* was a favorite in spite of its being "good literature."

There is much to be learned about the ways in which the school can influence values. According to one intensive study, it appears that at present the school is more likely to crystallize the character the pupil brings than to change it—that pupils who come to school with little conscience tend to remain that way whereas pupils with high moral maturity tend to maintain their original level (Peck and Havighurst, 1960).¹² All this raises a serious question as to how we can make the impact we would like to when a pupil's value system is inadequate. We will take up this problem in Chapters 11 and 12.

¹¹A good discussion of the adolescent's search for values will be found in *Growing Up Absurd*, by P. Goodman (New York: Vintage, 1956).

¹²R. F. Peck and R. J. Havighurst have formulated a theory of types of moral character based on stages in development. This theory is outlined in *The Psychology of Character Development* (New York: Wiley, 1960).

ADOLESCENT SOLUTIONS TO ADOLESCENCE

Most youngsters survive the period of adolescence with no ill effects, sometimes in spite of the ineptitude of the "help" they get from parents, teachers, and other specialists. If we can tolerate their mild deviations in behavior, they will find their way.

But there are increasing numbers, caught in the conflict of the adolescent culture, who are not to be eased through. For such youngsters under stress, there are several possible refuges.

Reliance on organized codes

Very few members of our society choose to "go it alone" entirely; there is a need for social support (Sherif and Sherif, 1965). In the quest for codes to govern their behavior, many young people become strongly attached to sources of organized value such as religious and quasi-religious organizations which are consciously endeavoring to establish codes. By attending to what are sometimes quite detailed behavior requirements they fortify their beliefs, and can be a "minority" adhering to their own values in the presence of variant behavior around them. Such behavior becomes a matter for concern only when it involves encroaching on the rights of others. Schools can work to diminish prejudice and encourage respect for the rights of others.

"Solution" by withdrawal

Noncommitment is more and more prevalent both in high school and college. It is symptomatic of an overall "so-what" approach. Motivating a student who asks "Why should I?" at every turn is a most difficult task. Many of these youngsters are not delinquent or negative. They are just flat, and fail to find anything exciting to challenge their talents either in or out of school. If you don't care about anything, you don't have to make decisions. Many times this is the outcropping of a long-standing dispute with life for which no solution has been found. Teachers do well to ask for consultation in working with such pupils.

Alienation as a style of life

Many adolescents solve their value problems by ignoring the accepted codes and designing one of their own. The so-called "hippies" are one such pattern. Here is no freedom from society but attachment to a fragmented code whose formal requirements may include a particular manner of dress, or a refusal to prepare for any useful role in society. Often there are "in" forms of behavior one is expected to comply with. School authorities may feel called upon to wage war on those who espouse a different set of values even when there is no interference with the rights of others. This makes the issue a matter of courage and constitutional rights. Of course, behavior which renders it impossible for the school to discharge its

responsibilities cannot be tolerated. But certain superficial symbols of career non-conformity are poor focal points around which to wage the battle.¹³

There is, of course, delinquent alienation as well, and this is a more serious personal and social matter. In all strata of society there are youth who have solved the dilemma of values by rejecting the legal curbs in regard to stealing, sex, alcohol, destruction of property, or aggression against others.¹⁴ While a higher percentage of these come from the ranks of the dispossessed, they are to be found in the best of neighborhoods as well. Much of it is disobedience with very little personal anxiety.

It is well to remember that while the overall percentage who accept junior criminal status is small, it is a very serious problem for many schools. The alienation involves more than out-of-school activities or even extracurricular disturbances at games. It includes the worship of racing cars, the disavowal of study, the refusal to put forth any reasonable effort. When it results in constant disturbance "until I can quit school," the school must seek help. As we shall see, however, not all dropouts fall into this category.

Activation as a means of value resolution

Adolescence is an age of impatience and intolerance of the absurd and dishonest. The sense of values is not yet inhibited by the temporizing of age. While some who battle the establishment are really alienated, others are highly activated. Their quest for values has led them into conflict with the injustice they see about them. They demand redress for what they feel to be lacking in their own education. They seek to help others less fortunate. What ought to be must be, and now. Some of these are the most able, conscientious youngsters, the cream of the crop. They want for all what they want for themselves.

In some ways they are the most difficult for the school to respond to with help. Their dissidence may be impolite. It may enlist outside help. It may demand curricular revision, policy revision, and even staff changes. It treads sacred territory. It puts adults on the defensive. As Friedenberg (1965) has pointed out, it refuses to see adolescence as a moratorium on usefulness. Here we have the opposite of escape: it is active engagement. There are, of course, reasons for most of the actions of the educational establishment, although some are harder to defend than others. But the struggle for involvement of these young people certainly suggests the need for frank discussion. Once the basic social responsibilities which underlie the interactions of the school and the adolescent are opened up to examination, both parties may find they have something to learn.

THE ADOLESCENT AND THE FUTURE

Adolescence is a time when anxiety about the future becomes very real. "What am I going to be?" If the individual does not ask this question of himself, others are sure to ask it of him. Often the first major choice a teen-ager must make is

¹³Many people see the school as a basic source of alienation among adolescents today. See *Society's Children: A Study of Ressentiment in the Secondary Schools*, by C. Nordstrom, E. Z. Friedenberg, and H. A. Gold (New York: Random House, 1967).

¹⁴Aspects of delinquency are discussed in *Anxious Youth: Dynamics of Delinquency*, by W. C. Kvaraceus (Columbus, O.: Merrill, 1966). An in-depth study of delinquent girls is presented in *The Adolescent Girl in Conflict*, by Gisela Konopka (Englewood Cliffs, N.J.: Prentice-Hall, 1966).

between a college-preparatory course and a general high-school program. The question of a vocation becomes increasingly pressing as high-school graduation nears. It is one of the major developmental tasks of adolescence.

Factors surrounding a sound vocational choice are complex. Frequently the adolescent does not know enough about the work to choose a vocation that will continue to be satisfying to him. Families sometimes pressure a youngster into entering a field for which he has little aptitude or interest. Sometimes the choice of a job boils down to the amount of social status a person needs to feel adequate. Sometimes it boils down to what is available.

The girl who hopes for an early marriage has the problem of preparing for some vocation, whether or not she has any real interest in it. On the other hand, there is the girl who would like to get married and have children but who prefers a career to housework. What should she prepare for? Most boys of this generation have the added uncertainty created by the prospect of military service after graduation.

There are many factors to be considered. Will the chosen work offer hours and wages compatible with marriage? What about security? Does the young person want to work with people or things? Does he want to be dependent but safe or does he prefer to work for himself? Can he take orders? What kind of job or profession will he be happy in?

To face these questions and to find answers for them is a long-term, gradual process. Counselors become very important as these decisions are worked out, and the available opportunities are not always the ones a romantic youngster might prefer. Testing, guidance conferences, conferences with parents, and class time devoted to the discussion of possible careers can be of some value in helping the teen-ager to reach a decision. The amount of vocational guidance being given in the schools is gradually increasing. Much more work and more effective work needs to be done along this line. Planned visits to offices, laboratories, and factories add realism to vocational understanding. Work-study programs give the student even closer knowledge of the world of work.

Interest in another type of preparation is intensified during this period—the preparation for marriage and family life. Acquiring a healthy approach to this area of life will make easier the adjustment to family living in later years. Such an approach is, of course, much easier to achieve for those who have grown up in a healthy, happy home. If a person's early development makes him ready at adolescence to achieve satisfactory relations with the other sex and become emotionally independent of his parents, he is well prepared for happiness in marriage.

The school can help the adolescent with this preparation by supplementing what he learns in the home. Many of the problems involved in family living can be opened up for discussion in courses such as economics, civics, history, and homemaking. Some schools offer courses in family living. Whatever the school offers in this area should help to develop a positive attitude toward family life.

The teen-ager who is to become a responsible adult has another task to work at during this period. This is the task of participating fully in the life of his community, his region, and his nation as a member of the world community.¹³ It is a task too often overlooked in the education of American youth.

¹³This aspect of adolescent development is discussed in "Growth of Political Ideas in Adolescence: The Sense of Community," by J. Adelson and R. P. O'Neil (*Journal of Personality and Social Psychology*, 1966, 4, 295–306).

The adolescent has a feeling of good will toward people in general and desires social responsibility. This is the time to develop that sense so that it will continue to thrive and to spur him on to later participation in the life of the community and larger social groups. The school can do its part in fostering this sense of responsibility by encouraging student participation in community projects such as tutoring or volunteer work for churches, hospitals, and political organizations. The life of the community can be studied in history and social studies classes. Books, magazines, and newspapers are rich with material that can help to generate a feeling of civic and social obligation.

MAKING SCHOOL MEANINGFUL FOR ADOLESCENTS

School can be a meaningful experience, but it is not automatically so. This chapter has covered the age range of two schools, the junior high school and the high school, each of which has particular relationships to its students.¹⁶

The junior high has been praised and damned.¹⁷ In some school systems, the junior high school consisting of Grades Seven, Eight, and Nine is being replaced by a "middle school" consisting of Grades Six, Seven, and Eight. Whatever the grade distribution, it is an in-between time of growing up. As we have seen, some of the youngsters are still preadolescent even in the ninth grade while others are quite mature (Coleman and Jungeblut, 1965). The student population is a mixture—part children, part adolescents. The middle school will need to provide a transition from the elementary-school setting, where most pupils were from the same neighborhood, and where the oldest were "top dogs." Now, joined with many others, and made anxious by the tales told by older students, they come to the new, larger complex. It is enticing but frightening at the same time. There are some who have been told they will never make it. They worry about finding their locker and their way around. Yet they will be more grown up, and have many teachers. Sports and activities loom large. It will be great—if they can make it.

Good teachers for this age should not be threatening. They will find very poor readers who somehow were passed along, and it will be easy to blame and talk of "shaping up." As one student said, "I never got such grades as in this seventh grade. I worry if I will pass at all."

The usual arrangement is to have one teacher who knows the group well, usually a homeroom teacher. Rather than all separate courses, blocks of time for integrated studies (science and math perhaps, or English and social studies) are often scheduled. It is a time when remedial skill teaching is vital to help the slower ones, and when flexibility should be present to challenge the able. Help in forming good study habits is often required. Also, it is a time for youngsters to find out about new subject areas from physical education to art, shops, and prevocational exploration. Many schools work directly to help with socialization difficulties through camping trips and projects. It is a chance for vast expansion of contact with the world, both symbolic and actual.

¹⁶For further discussion of the relationships of these schools to their students, see "Sex and Age Differences in Life Problems of Adolescents," by H. Kaczowski (*Journal of Psychological Studies*, 1962, 13, 165–169) and *Psychology of Adolescence for Teachers*, by G. M. Blair and R. S. Jones (New York: Macmillan, 1964).

¹⁷For a discussion, see *The Junior High School*, by N. L. Bossing and R. V. Cramer (Boston: Houghton Mifflin, 1965).

The important thing to remember is that in most states there is no escape from junior high school. Compulsory education laws keep children in school, but only the program can make it worth while. Of great concern is the matter of the less gifted, who cannot keep up with their fellows and who need special programs since the understanding and tolerance they found in the one-teacher elementary class is harder to come by here. More and more assistance is needed from guidance counselors.

Sometimes before they are ready, and often before their teachers feel they are ready, they are to be passed along to the high school, and what is generally an intensified experience.¹⁸

Why do so many of those who enroll in high school drop out before they graduate? "Forty per cent of American children drop out of school before high-school graduation. Beyond these, tens of thousands . . . are underachievers" (Lichter, Rapien, Seibert, and Sklansky, 1962). Lichter and his associates found the dropouts to be unsuccessful and unhappy in school, largely because of severe emotional problems. They were not leaving for "better things." Increasing academic pressure only makes things more difficult for these youngsters, many of whom are several years retarded in reading. Special schools and counseling services for the youth and their parents are needed, in contrast to the present tendency to get rid of the misfits. One high school reported to one of your authors that they had over sixty in each class of the senior high who were beyond their resources to help. In some instances all these pupils could see ahead was the long wait until they were of age to leave. As we all know, the future of those who do not have at least a high-school education is dim in this society.

While the Lichter study emphasizes the psychological aspects of the dropout problem, others have demonstrated that conditions of deprivation reduce the holding power of schools drastically. This is not so much a consequence of personal maladjustment as a response to a total social condition in which there is little hope or motivation. These youths lack belief in themselves and their future; they often lack sufficient parental support for educational effort; they lack positive encouragement from their peer reference group, and they find a lack of hospitality in the typical educational setting. That this is not "just the way those people are" has been made very clear in several studies. If there is a purpose to continuing and there is encouragement, the dropout rate can be reduced considerably in this group which, above all, needs all the assistance education can give. Many large cities have programs, but the deprived child, wherever he is, needs such help.¹⁹ Nothing short of a determined and total effort to extend our concept of individual differences to accommodate the problems of these youngsters will provide adequate programing for them.

In summary, there are complex problems behind every dropout, as Kubie (1965) notes; the causal factors range from sociological and economic to medical

¹⁸Two excellent sources of information on high-school education today are K. Hoover, *Learning and Teaching in the Secondary School* (Ann Arbor: Education Library, University of Michigan, 1964) and R. N. Bush and D. W. Allen, *A New Design for High School Education* (New York: McGraw-Hill, 1964).

¹⁹An excellent review of the literature on this topic can be found in L. D. Crow, W. I. Murray, and H. H. Smythe, *Educating the Culturally Disadvantaged Child* (New York: David McKay, 1966). The results of one program designed to combat the dropout problem are discussed by A. Davids and J. M. Andrews in "Changes in Academic Attainment and Personality Characteristics Following a Special Educational Program for Underachieving Secondary School Boys" (*Psychology in the Schools*, 1964, 1, 388-391).

and psychological. While part of the difficulty can be traced to out-of-school conditions, there are many in-school issues as well. Continual failure and a feeling of not "belonging" have been noted (Elliott, Voss, and Wendling, 1966). Janssen (1968) has found that in the lower socioeconomic class, the dropout is more creative than the pupil who stays in! Programs to reduce the percentage of dropouts incorporate a diversity of approaches including remedial teaching, on-the-spot counseling, vocational training courses, job placement for credit, a lower pupil-teacher ratio, and work with families (Longstreth, Shanley, and Rice, 1953; Lodato and Zweibelson, 1965).

Almost as important as the problem of those who drop out of school is the issue of the returnee. Frequently an adolescent finds out the hard way that education has a value in the real world of jobs as well as in his personal life. But once out, the way back is difficult even if he wants to return, because he has to admit his error, find his way with younger students, and retrace steps toward a goal which may seem distant. Some school systems, such as that of Detroit, Michigan, have found a way to help these students by building a separate design for them which includes certain special classes, some work experience, and wise teachers and counselors. As the pressure for technological training increases in the employment market, the road back to school must be made accessible without a punitive "I told you so" attitude.

How much does the school program really challenge the capacities of young people? At the age of seventeen most of them have achieved 95 per cent of their intellectual capacity (Jones and Conrad, 1944). The power to reason, to analyze, to relate, to think, and to remember is present at almost an adult level.

During the teens, progress also is made in the development of fine motor and mechanical abilities. Reaction time and eye-hand coordination show rapid improvement. Mechanical dexterity improves. Young people by their late teens are ready for adult work. Are the schools prepared to provide them with it?

The practical bent of many adolescents dictates a functional approach, and many schools have developed work-study programs where practical, job-oriented learning is the core.²⁰ Such programs, which enable the student to combine classes with a part-time job in the community, have several advantages. They enrich the program of the student who is capable of handling more than the required academic work, thus keeping his interest. They give added meaning to subject matter. They give students who need to be partially self-supporting an opportunity to earn money, as well as providing needed experience in the workaday world.

Where such programs are offered, dropouts are fewer and there is less need later for expensive retraining programs like that of the Job Corps. The explosive results of untrained teen-agers roaming the streets with no job in prospect, have been all too evident in recent years. These youngsters need not only job skills but the related verbal competency required by our language-oriented society. They need additional counseling support, smaller class groups, and, very likely, remedial instruction as well.

In the famous Conant report on American high schools (1959), many changes are suggested to make our high schools serve both national purposes and adolescent needs better. Conant feels that we need comprehensive high schools with

²⁰The benefits of work-study programs are discussed by M. K. Freedman in "Part-Time Work Experience and Potential Early School-Leavers" (*American Journal of Orthopsychiatry*, 1963, 33, 509-514).

varied offerings which can serve all youth in the community whether they go on to college or go directly into the work world, but that above all there is need for a good general education for all citizens.²¹

There is no magic formula, no magic list of courses to solve the problem of the high school's responsibility to its students. In a complex and changing culture such as ours the school curriculum must be reassessed and revamped continually to meet the changing needs of the students.²²

Reading

Thomas R. Leidy and Allan R. Starry

THE AMERICAN ADOLESCENT—A BEWILDERING AMALGAM

How do American teen-agers look at the world around them? What are their opinions about school, about dating, about taking responsibility? How does it feel to be a teen-ager? The teacher who hopes to have a solid foundation for communicating with his students must be aware of their attitudes and ideas. This article presents some of the findings of a nation-wide survey of adolescent opinions conducted by the Purdue Opinion Panel.

American society today is characterized by internal discord and international tension, hot and cold wars, and dramatic social and technological change. Merely living in such an environment seems to require virtually all an individual's resources and skills; growing up in it is problematic indeed. It is not surprising that being an American adolescent is a difficult and demanding experience. During his seven teen-age years, an individual must acquire and perfect the techniques necessary for survival in our society (highly sophisticated skills and difficult to master) while he tries to learn about himself, his peers, and his elders and to make that painful transition from child to adult.

It is important that attempts be made to understand the teen-age subculture which constitutes such a large and complex segment of American life. Since the adolescent is a product of adult society, understanding his behavior and motives involves understanding those of adult society also. At the same time, however, the adolescent is a member of a subculture all his own with distinct and unique values, rituals, and mores—a phenomenon worth investigating in its own right.

With this in mind, H. H. Remmers founded the Purdue Opinion Panel, a continuing series of surveys of the attitudes, beliefs, and behavior of American youth. Since its inception in 1942, the Panel has executed 80 large-scale studies,

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²¹See *The American High School Today*, by J. B. Conant (New York: McGraw-Hill, 1959). While all of this small volume is pertinent, his twenty-one recommendations point out critical needs.

²²The October 1964 issue of *Review of Educational Research* is devoted to educational programs for adolescents; it includes articles dealing with guidance and the dropout problem.

using as respondents students attending public high schools throughout the United States.

Each school year, 100 to 125 schools serve on the Panel. School personnel administer opinion questionnaires, tests, and inventories of various types to participating students and send the materials to Purdue University for processing. From total returns (usually 15,000 to 20,000 per poll) a representative sample of 2,000 students is drawn for analysis. The sample is proportionate to the total population of public high school students in terms of sex, grade level, rural-urban residence, and region of residence.

In 1957, Dr. Remmers and D. H. Radler wrote *The American Teenager*, a book based on Panel data. They analyzed in great detail many aspects of American youth culture and tested several hypotheses concerning the basic determinants of normal and delinquent behavior. In the discussion which follows, data obtained more recently are compared with some of the material presented in *The American Teenager*. We will discuss two areas affecting all high school students: their views on education and attitudes toward school and their social development and relations with parents and peers.

School is a complex and constant concern of American youth. Consistently since 1953, about three-fourths of the students sampled have responded positively to the following question:

Taking everything into consideration, how do you feel about school?

	1953	1958	1965	1967
I like it very much.	32%	27%	21%	16%
I like it most of the time.	43%	46%	51%	57%
I don't like it very much.	23%	24%	24%	25%
I dislike it.	2%	3%	2%	2%

Note that while the negative responses to this item have remained constant over the past 14 years, positive responses have shifted steadily away from an unqualified "I like it very much" to the more moderate "I like it most of the time." Despite the generally favorable attitude, many students are critical of their education and the manner in which schools are run.

Most students strongly favor a student government with some authority in school operation, though they do not support the notion that such a student body should have disciplinary power over students.

What do you think a student government in your school should be allowed to do?

	Percent Answering "Yes"	
	1953	1965
Plan assemblies and convocations	74%	82%
Make rules about conduct in school	70%	63%
Hold court and try students who break rules	45%	33%
Have power to fine or otherwise punish students who break rules	34%	28%
Poll students on ways to improve school	86%	84%
Meet with teachers and principal to advise them on how students feel about school matters affecting them	88%	88%

A senior girl from Wisconsin writes, "The thing I like most about school is the way this school is run. It is a fifty-fifty deal. The student council is always heard and usually listened to." . . .

School assignments and homework have an important, and usually negative, influence on students' relations with their friends. A boy living on the West Coast writes, "The thing that bothers me most about my friends is that they always want me to help them with their school work when I don't even have my own finished." A tenth grader from Georgia complains, "They don't study much and when I am around them I cannot study." A senior girl from Iowa says, "Some of my friends study too much!"

Time spent on homework has shifted significantly since this question was first asked in 1948:

How long each day, on the average, do you spend working on school assignments after school hours?

	1948	1962	1967
Less than one hour	39%	21%	32%
One to two hours	54%	58%	47%
More than two hours	7%	16%	20%

Three-fourths of the students sampled are convinced that earning high grades in school is "extremely important" or "very important." Sixteen percent think it is "somewhat important." Only 3 percent of the sample feel that grades are of little or no importance.

The drive for grades often results in cheating—on homework and in tests and examinations. Since 1949, three-fourths of the students sampled consistently have stated, "Cheating is wrong; never justifiable," 20 percent feel that cheating is "sometimes justifiable," and about 5 percent think that cheating "does no harm."

In spite of strong agreement that cheating is wrong, only 5 percent say they have never cheated. . . . Teachers' emphasis on test grades is consistently the most often mentioned cause of cheating. However, the number of students who say that their cheating results from their parents' emphasis on grades, has risen substantially since 1948, from 10 to 25 percent.

High school students' view of the value education should have for them has shifted significantly over the years. In 1953, most students considered the acquisition of social skills the most important aim in education; slightly fewer favored "a sense of discipline and responsibility." By 1961, the academic area was selected as much more important than other outcomes. In 1966, discipline and responsibility ranked first (39 percent), closely followed by academic skill (35 percent).

Asked what they like about school, many students express approval of the intellectual aspects. A senior girl from Minnesota writes, "I enjoy classes in which the teachers present mature ideas and mature information to a group of adults." A tenth grade boy likes school because "You get a *chance* to learn whether you do or not." A girl from Arizona writes, "I enjoy school and I like learning new things. I find great satisfaction in discussing news, arguments, et cetera."

If high school students today tend not to perceive social development as part of their school training, it is not because interpersonal relationships and social responsibilities are unimportant to them. In some respects the student submits to

rules established by adults; in others, he establishes his own rules or conforms to the codes of his peers. In all cases, he sees these relationships as both the joy and woe of his time of life.

A boy from Arkansas writes, "The thing that bothers me most about my friends is that I don't understand them at all times and they don't understand me." A girl from New York complains, "My friends get so worried about things like sororities, cheerleader tryouts, Latin, and many of them are always complaining about how dull everything is and that they don't have nothing to do."

Many students echo the fears expressed by a boy and girl from Louisiana. The boy worries about "what my friends think of me." The girl is "afraid I will do something that will make my friends mad at me."

More than half (59 percent) of the students sampled in a recent survey agree that the only way to really develop your personality is to have many friends. Although three-fourths of the sample think they are popular, 68 percent wish they had more friends.

Despite this expressed desire for friends, 65 percent say, "Most teen-agers try too hard to be well liked"; and 52 percent say, "Most teen-agers try so hard to be popular that they look foolish."

Students' responses to items concerning peer-group control of their behavior suggest that they view such influence without approval. Sixty percent of those sampled think, "Most teen-agers follow the crowd without thinking for themselves" and "Teen-agers are very unfair to those who want to act differently from the crowd." Sixty-two percent say, "Teen-agers who follow the gang often must give up what they really like to do." According to 41 percent of the students, "You sometimes have to go along with the crowd even if you don't like what they do."

Though they seem convinced that the group exercises certain sanctions on their behavior, most students question the validity and importance of those sanctions. Only 25 percent of the sample agree that "a person who doesn't like to run with a gang is pretty odd." Twenty-seven percent believe that "probably the worst thing that can happen is to be dropped by the gang."

These data point out the fundamental paradox in American youth culture. It is accepted by most adolescents that the influence the group has on their behavior is superficial and, in the long run, not particularly important. Nevertheless, the need to be popular is pervasive and requires that they accede to group demands.

Equally important and no less confusing to American youth are their relations with the opposite sex. A boy from Wisconsin complains "I am constantly searching for the 'best' or perfect girl. Whenever I find one, I feel inferior to her." A girl from New Jersey lists typical male characteristics: "immature, inattentive, obnoxious (at times) and lovable." A boy from Illinois describes girls: ". . . their feeling of superiority. They talk too much, their sloppiness about their hair and their inability to cope with reality. I like them very much."

Forty-two percent of the sample report that they date once a month or less; 35 percent date two, three, or four times a month; 21 percent report dating at least twice a week. About half the students wish they had more dates, but only 16 percent say their parents are too strict about dating. Apparently, too infrequent dating is not the result of parental restriction.

Questions concerned with dating behavior elicit widely varied responses. Asked to describe a perfect date, one high school senior would like to "go to a

stage play or musical and later discuss the merits and demerits of the performance given over dinner at Traitor [sic] Vics." One tenth grade student's idea of a perfect date is to "Talk nice to the girl. Ask her if she wants a bottle of pop. Don't be dirty with her." A senior from Massachusetts says, "Go out and park, but bring her home on time." Behavior so diverse is difficult to summarize.

Fifty-seven percent of the students sampled are now going steady or have gone steady in the past. Going steady is, of course, a common source of disagreement between parents and children. It also is cause for concern among students. A girl from Arkansas complains, "Boys think they own you if you go out with them one time." A boy from Pennsylvania remarks, "If you have 1 or 2 dates with a girl, and then have 1 or 2 dates with another girl, it is highly objectionable in female circles. It seems you're a cad or playboy if you don't go steady after a few dates."

Forty-five percent of the sample agree that most teen-age romances are just puppy love, but only 16 percent feel that high school students are too young to go steady. Almost half the students surveyed believe that high school seniors are old enough to consider marriage. Girls would most like to marry when they are about 20 years old; boys prefer to wait until they are 23 or 24.

Concern about morals and sexual behavior is expressed by many students. Girls complain about boys' aggressive behavior ("They try to see how far they can go"); boys complain that girls flaunt their sexuality ("Even a nice girl can give a boy the wrong impression"). . . .

Many observers of contemporary culture have pointed out the general relaxation of American moral codes and increasing freedom of sexual behavior. High school students generally agree with these observations: 52 percent feel that in the future moral standards in the United States will be less strict; 26 percent believe that our moral standards will remain about the same; and 20 percent think that standards will be more strict. The trend toward increasing tolerance of sexual behavior is supported strikingly by students' responses to the following item:

If I learned that some friends of mine had not followed the morals or rules relating to the behavior of unmarried people:

		Total	Boy	Girl
I would not consider them good friends anymore.	1952	57%	46%	67%
	1965	30%	22%	38%
	Difference	27%	24%	29%
It would not make any differ- ence in our friendship.	1952	43%	54%	33%
	1965	69%	77%	60%
	Difference	26%	23%	27%

In 1952, a majority of the students sampled (57 percent) chose the first alternative to this item—"I would not consider them good friends anymore." In 1965, 69 percent of the sample chose the second alternative—"It would not make any difference in our friendship." At both times, boys were much more tolerant than girls of their friends' not conforming to established sexual mores.

While these data are not concerned with the personal morality of high school youth, they do suggest that students' moral standards and attitudes toward sexual behavior are much more liberal now than in the past.

Asked what they enjoy most about being teenagers, many students discuss the real, though limited, responsibilities they may take. A girl from Massachusetts writes, "Your basic reputation is left entirely to you and you get your first touch of real responsibility." A boy from Georgia speaks of . . . "having small problems and little responsibilities." A tenth grade student living in New Jersey says, "We are allowed to make our own decisions and accept responsibilities that were previously denied us."

Many students comment that while they are free to make many decisions for themselves, their parents and teachers are available to back them up and to help them recoup when the decisions made turn out to be the wrong ones. Adult influence, however, is both desirable ("I have my family to fall back on") and not so desirable ("Why can't they leave me alone?"), depending on the individual and the situation.

Listed below are a group of decision situations. All but one elicited the response "I decide" from the majority of students.

	My Parents or Family Decide	I Decide
How late you can stay out on a date	67%	31%
What time you go to bed at night	21%	75%
How you spend most of your money	8%	83%
What you are going to do this summer	22%	72%
Whether you go steady	19%	75%
Whether you will go to college	27%	67%
What your future occupation will be	7%	87%

Most adolescents adjust adequately (if a little noisily) to the world in which they must live. However, for many others life is quite difficult, help is hard to find, and hope is about gone. A young girl from California describes clinically her weight problem which is compounded when her parents and brother ". . . call me fatty or glut. . . ." She concludes ". . . many times I have thought seriously of committing suicide." A junior from Pennsylvania writes "I think I am an alcoholic. And I just don't know what to do about it."

This, then, is the American adolescent—a bewildering amalgam of conflicting moods and motives, habits and dreams. At times he seems all energy and innocent optimism. Then again, he is cynical and wise beyond his years. His values seem sometimes distorted, his attitudes a bit bizarre. He pays too much attention to his friends and what he sees on television and not enough attention to his parents and what he hears in school. He is aware of his many conflicts and problems (knows that adults, finally, are responsible for many of them) and realizes that he may never resolve them all.

Part **3**

THE PROCESS OF LEARNING

Learning As the Psychologist Sees It

Learning in the Classroom

Kinds of Learning

Group Aspects of Learning

LEARNING AS THE PSYCHOLOGIST SEES IT

In any learning situation there is a learner with his past experiences, his present abilities, his needs, and his feelings. The learner undergoes some kind of *experience*. He does not simply learn by growing older. His experience, whether it is reading a book, listening to a lecture or a recording, or practicing a skill, includes: (1) some perception, (2) some manipulation of ideas, (3) some feeling, and (4) some motor activity. As this perceiving, thinking, feeling, and doing take place, changes occur in the learner's ways of perceiving, thinking, feeling, and doing.

Thus, learning can be defined as changing one's potential for seeing, thinking, feeling, and doing through experiences partly perceptual, partly intellectual, partly emotional, and partly motor. It is assumed to involve processes in the nervous system that so far have been only partially identified. Our inability to pin them down is one reason why there are so many theories of learning.

Just as every teacher has an idea about human nature—whether the originally given human potential is naturally good, bad, or indifferent—so does every teacher have an idea about human learning. Some teachers have specific and detailed theories about the way children learn. Some have concepts but do not recognize these ideas as a theory of learning. But their theory can be read in their actions. It may be such a simplified notion as “practice makes perfect” or “motivation is the key.” Some see their jobs as filling empty pitchers, others as molding shapeless but often recalcitrant clay. In practical terms, the way a teacher sets up a lesson is a reflection of his thinking about the ways in which the desired learning can be facilitated. For example, some teachers depend upon creating test anxiety to pressure learning. Others attempt to structure the work by assigning long outlines of the subject matter. Some concentrate on finding ways to enhance motivation.

Whatever the nature of learning, we do know that children acquire many new behaviors in school—though not always those which teachers might have anticipated or desired. Children are always learning; that is, they are changing their behavior. But often they learn something we do not intend. The problem is to control

the learning process so that the changes we (and presumably the pupils) want will be the ones that are forthcoming. The sooner and the better we understand the processes involved in learning, the more we will be able to foster the changes we have in mind, rather than finding that the children are responding to conditions we do not recognize.

To control the process, then, we must study it. Knowing about children's development and potentials only sets the stage; it does not of itself tell us how to direct children's specific learning. Thus time devoted to formulating our ideas in the light of what has been said by the learning theorists will be in no wise wasted. It lies at the heart of our professional task.

FROM THE LABORATORY TO THE CLASSROOM

Studying learning is not as easy as it sounds, especially in the natural setting of the classroom. Because there are so many subtle and interacting variables to cope with in the classroom, the formalized study of learning usually takes place in the psychology laboratory and, where simpler forms of learning are being studied, frequently involves animal rather than human subjects.

Early psychologists, in their attempt to be completely scientific and objective, studied only observable, measurable behavior and sought to relate it to definite stimuli, also observable and measurable. They shied away from any study of consciousness and any implication that it could affect behavior. It was regarded as an "epiphenomenon"—something that occurred only as a by-product of neural processes. Learning was conceived of as a mechanical, automatic "stamping in" of "correct" responses and elimination of "errors" through repetitions with the proper application of rewards and punishments. Studying cats in puzzle boxes and rats in mazes, they saw blind trial-and-error behavior and assumed that all learning followed this pattern. Operant conditioning of pigeons through stimulus control and judiciously applied schedules of reinforcement is a modern-day use of the same assumptions—that manipulation of the environment produces learning mechanically and that what the learner is experiencing does not need to be taken into account.

But in a puzzle box or a maze there are no intrinsic relations between the reward and the motion that leads to it. There is no inherent reason why pressing a bar should produce a pellet of food. It is an arbitrary relationship. So it *has* to be discovered accidentally, by blind trial.

If a school learning situation looks to a child like a puzzle box or a maze, then he too will have to act blindly if he is to identify what the teacher wants him to learn and learn it. But if the new situation offers him a chance to satisfy his curiosity, his behavior is quite different. He plunges in with enthusiasm, seeks the particular things he knows he needs, relates his new findings to each other and to what he already knows. There is trial and error, but not blind or mechanical trial and error, and the learning is not *rote* learning as it must be where only blind activity is possible.

There is a deep gulf between the conditioned-response learning of an animal in a laboratory and the creative learning of a purposeful, thinking human being. "Higher" mental processes like reasoning, imagining, reorganizing and integrat-

ing ideas, analyzing, and evaluating—important components in much of the learning human beings do to survive and improve their lot—can hardly be studied adequately through conditioning experiments, especially with animal subjects. And to the extent that the learning studied in the laboratory often has not even involved consciousness, we would expect it to differ in important ways from cognitive learning, in which not only awareness but a complex use of abstractions and symbols are important features.

Even the so-called “verbal” learning studied in the laboratory has typically been simple rote memory of unrelated words—often, in fact, of nonsense words. It has rarely involved conceptual material in which there was an inherent structure of necessary relationships. In fact, the earliest experimenters believed that learning could be studied in “purer” form by the use of materials uncontaminated by meaning. Interestingly, concept learning has usually been studied through visual forms rather than verbal material.

Both psychologists and teachers now realize the great importance of both meaning and learner motivation in classroom learning. A child’s learning of academic material is heavily dependent on the extent to which he can see relationships and meanings and potential usefulness in what he is studying. So the learner—with his perceptions and motivations—is increasingly regarded as a partner with the teacher in the teaching-learning enterprise. He is not an empty vessel to be filled with the teacher’s knowledge or an automaton into which one can “stamp” correct responses. He is an active, growing being with ideas, values, interests, needs, and a reservoir of past experience to draw on and reconcile with new experiences. It is not enough for him to learn specific, rigid, “right” answers. He needs to learn attitudes, ways of meeting new situations, flexibility, and personal responsibility.

Understanding learning of this kind requires a knowledge of both conscious and subconscious influences. Teachers try to study the learner and what he brings that can be built upon. When a new relationship must be discovered or a new movement made (as in typing), they try to arrange the situation in such a way that the learner is not dependent on blind trial and error but can make what E. R. Hilgard has called a “provisional try,” a response that seems appropriate for his purpose on the basis of what he knows.¹

This try is “confirmed” or not by the results: if it is confirmed, the learner will tend to retain the response and use it again; if not, he will try other possible responses. In most cases he knows enough about the situation and the necessary response to formulate several hypotheses. Success or failure of a try can provide both “feedback”—knowledge of correctness or incorrectness—and a feeling of satisfaction or disappointment.

Yet despite the new focus on the learner’s perceptions and motivations, it is often difficult to apply the findings of laboratory research to problems of teaching. Classroom learning experiences and laboratory learning experiments still differ in several important respects.² For example, laboratory learning is largely untaught learning. The subject is on his own to learn as best he can. He gets no help in

¹E. R. Hilgard and G. H. Bower present detailed discussions of a number of learning theories in *Theories of Learning*, 3rd ed. (New York: Appleton-Century-Crofts, 1966).

²The relationship between learning theory and classroom practice is the topic of the Reading at the end of this chapter.

organizing material or in identifying the correct response. Just how far the same laws of learning will apply in situations where such help is present, we do not yet know. We would expect taught learning to follow a somewhat different course and to be considerably more efficient.

The laboratory psychologist is primarily an objective scientific *observer* of the nature of learning phenomena. Theoretically, at least, he has no vested interest in the results. The teacher is a responsible *participant* in developing learning experiences for and with children that will produce certain stated objectives. The quality of learning and its effect on the children are an important part of the teacher's responsibility.

It is one thing for an experimental psychologist to conduct controlled learning *experiments* under laboratory conditions and quite another thing for a teacher to plan and guide learning *experiences* with thirty-five children for six hours a day in school. In a laboratory learning experiment it is enough for there to be a "right" response, a specific, predetermined, carefully defined act as evidence of "learning." This is why verbal learning experiments have usually used verbatim memorization. But teachers are no longer content with perfect recitations of memorized material, and it seems likely that where learning proceeds through inquiry, exploration, and group effort, quite different processes may be at work and the "laws" established for conditioning and verbatim memorization may not apply.

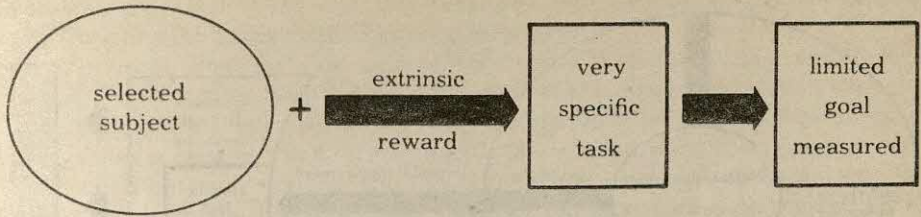
The experimenter's interest is in finding out what happens under particular conditions. To this end he must choose his subjects carefully and set a relatively simple and highly specific task for them to perform. He provides motivation by introducing an extrinsic reward or punishment, such as food in the case of a rat and money or course credit or the chance to contribute to scientific knowledge in the case of a college student. Then, by changing the amount or kind of reward or the amount of time allowed or the spacing of practice periods, or introducing some other specific change in the experimental conditions, he can study the effect of different variables on the subjects' learning performance.

The teacher operates in quite a different framework. First of all, he has a stake in the end product. He wants to obtain particular objectives, usually multiple. Second, learning conditions in a classroom are not simple and restricted but highly complex. Many learnings are going on at the same time, and the learnings he is trying to foster are far more complex than the simple tasks of the learning experiment. He has little or no control over the kinds of learners he gets: he must take what comes. And to achieve his objectives he must know how to enlist and work with their individual capacities, their past experiences, their present needs and interests. These are factors the experimenter can "control" and then disregard.³

Furthermore, extrinsic rewards and punishments, such as high grades and teacher's praise, may not motivate a child to learn what the teacher wishes. For example, if the class as a group tends to ostracize good students, a child capable of superior grades may intentionally do only average work. The threat of low grades does not always motivate a pupil to study harder. Thus the problem of ensuring

³D. P. Ausubel points up the fact that even the same phenomenon, such as problem solving or rote learning, may look quite different in laboratory and classroom. See his article "Learning Theory and Classroom Practice" (*Ontario Institute for Studies in Education Bulletin*, 1967, No. 1). On the same topic is "Does Learning Theory Apply to Education?" by W. F. Hill (*Psychology in the Schools*, 1964, I, 339-344).

SCHEMATIC DIAGRAM OF A LABORATORY LEARNING SITUATION



effort on the part of the learner is likely to loom far larger for the teacher than for the laboratory experimenter. The schematic drawings of laboratory and school learning summarize the points we have been making.

Recently social psychologists have moved toward naturalistic experimentation through field research carried out in typical school settings. For example, Becker and his co-workers took their theory of reinforcement into the classroom proper in an attempt to reduce behavior problems in a lower-class school. They selected youngsters with behavior problems and worked on such areas as disturbing others, noise, gross motor behavior, and talking out. On the scale of measurement used, the average deviant behavior for ten children in five classes was 63+ per cent. Teachers with quite different styles were able to apply the operant theory, ignoring deviant behavior and rewarding appropriate behavior with praise and attention. (With a few of the children, additional procedures proved necessary.) At the close of the seven-week period, the average deviant behavior was 29+ per cent.⁴ Such research does not permit close control of all the many variables but often has yielded extremely helpful findings. Several such studies will be referred to in the chapters that follow.⁵

LEARNING THEORY AND THE TEACHER

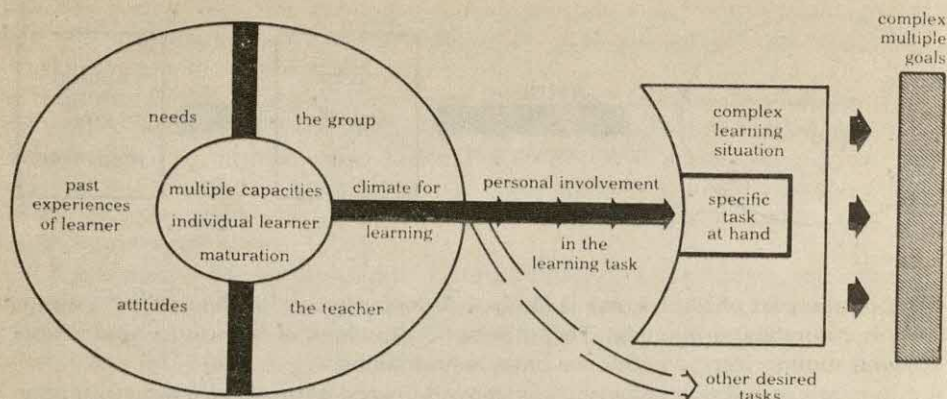
Learning theory, even at its simplest, is a lifetime study. Our purpose here is not to give a broad survey or even a quick once-over of several dominant figures.⁶ Rather it is to see major viewpoints and how they suggest elements for teacher

⁴This study is described in "The Contingent Use of Teacher Attention and Praise in Reducing Classroom Behavior Problems," by W. C. Becker and others (*Journal of Special Education*, 1967, 1, 287-309). There are three other articles dealing with this approach in this issue. Another good source is the *Journal of School Psychology* for Winter 1968.

⁵Psychologists themselves do not agree on the extent to which laboratory findings can or should be applied in the classroom at this stage. A symposium presenting several answers is found in "Can the Laws of Learning Be Applied in the Classroom?" (*Harvard Educational Review*, 1959, 29, 83-117). The naturalistic method, sometimes referred to as "psychological ecology," is discussed by Herbert F. Wright in "Observational Child Study" (Chapter 3 of *Handbook of Research Methods*, P. H. Mussen, Ed. New York: Wiley, 1960) and "Toward a Psychological Ecology of the Classroom" (*Journal of Educational Research*, 1951, 45, 187-200).

⁶A good source of information on learning theories is the Hilgard and Bower volume cited earlier. Others include *Theories of Learning and Instruction* (N.S.S.E. 63rd Yearbook, Part 1. Chicago: National Society for the Study of Education, 1964); R. C. Craig, *The Psychology of Learning in the Classroom* (New York: Macmillan, 1966); and J. C. Jones, *Learning* (New York: Harcourt, Brace & World, 1967).

SCHEMATIC DIAGRAM OF A SCHOOL LEARNING SITUATION



use. It is not a question of who is right and who is wrong. The question is rather where each approach may be useful and what elements of control of the learning process are suggested for the teacher. A good deal of the waxing and waning of theoretical positions is due to changes of emphasis on different educational objectives. At one time drill on fundamentals may be in the spotlight. At another time it may be the socialization process. Most teachers find themselves to some extent involved in all these things, regardless of the fads of the day. The chart on page 174 lists six present-day learning theories, along with their basic assumptions and implications. You may find it helpful to refer to this from time to time as you read the remainder of this chapter.

Hilgard and Bower (1966) indicate six questions which a comprehensive theory of learning should be able to answer:

1. "What are the limits of learning?" This has to do with individual differences.
2. "What is the role of practice in learning?" This has to do with understanding the conditions that foster improvement.
3. "How important are drives and incentives, rewards and punishments?" This has to do with motivation.
4. "What is the place of understanding and insight?" How well do we need to understand something in order to learn it?
5. "Does learning one thing help you learn something else?" This is the issue of transfer of training.
6. "What happens when we remember and when we forget?"

Most learning theories do not attempt to address themselves to all of these questions. Nonetheless they are all questions of importance to teachers.

Stimulus and response — the external aspects

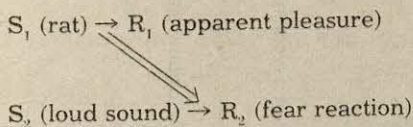
Association as a general psychological explanation for learning phenomena is at least as old as Aristotle and is seen today in systems of connectionism such as that

of E. L. Thorndike, in E. R. Guthrie's contiguous conditioning, and in the operant conditioning of B. F. Skinner. It is the explanation of learning accepted in one form or another by the behaviorist school of psychology.

The basic element in the associationist paradigm is the well-known $S \rightarrow R$ of classical conditioning theory. Under this view of the process, patterned after the conditioned reflex, learning occurs when the learner is presented with a stimulus and makes a response to it. "Learning" is the establishment of an association or connection between stimulus and response. While a strict psychological associationist will maintain that all learning behavior ultimately can be accounted for in these terms, there are many psychologists who do not accept this position. Our purpose here is not to debate the case again. The point is that the associationist interpretation can be useful to teachers in better understanding certain kinds of learning tasks that fall within the province of the school's responsibility.

Can the learning process be managed by giving careful attention to the stimulus and the response? According to $S \rightarrow R$ theories, certain stimuli are innately adequate to bring about certain responses in the organism. Seemingly we are born with a multitude of $S \rightarrow R$ sequences already "built in," which can then be used in developing new sequences of behavior.

A loud noise produces a startle response in infants. J. B. Watson demonstrated that if a second stimulus was presented while a child was responding to a loud noise, the new stimulus would come to elicit the same response as the noise. While the child was petting a white rat, a loud gong was sounded. The presence of the rat (or, as it turned out, any furry object) became associated with the innate response, which in this instance was not just a startle but real fright. The sequence can be pictured as follows:



As Guthrie points out, the important thing is to note that *what we do is what we learn*. Thus all stimuli operating at the time we make a given response will tend to become associated with that response. It is essential to bear in mind that learning consists of a new S becoming able (usually after many repetitions) to call forth the R which was dominant at the time the S was presented. Thus, if the R in effect during a music appreciation course is negative—*anxiety over not being able to identify themes on a test*, for example—it can be anticipated that the next time that type of music is heard it will tend to produce tension instead of the enjoyment the teacher intended.

Conditioning is always taking place—but not always according to the teacher's plans. Let us consider another example. The teacher has asked the sixth-grade social studies class to read their assignment, "How Our City Is Governed." Interest in the task is low, and the noise soon becomes intolerable. There are several S 's operating here, of course. The assigned task is only one of these—the important one as far as the teacher is concerned, but not the one claiming the children's attention.

REPRESENTATIVE THEORIES OF LEARNING AND THEIR IMPLICATIONS FOR EDUCATION

THEORY OF LEARNING	PSYCHOLOGICAL SYSTEM OR OUTLOOK	ASSUMPTION CONCERNING THE BASIC MORAL AND PSYCHOLOGICAL NATURE OF MAN	BASIS FOR TRANSFER OF LEARNING	MAIN EMPHASIS IN TEACHING
CONDITIONING THEORIES OF STIMULUS-RESPONSE (S-R) ASSOCIATIONISTIC FAMILY	S-R bond	neutral-passive or reactive organism with many potential S-R connections	identical elements	promotion of acquisition of desired S-R connections
	Conditioning (with no reinforcement)	neutral-passive or reactive organism with innate reflexive drives and emotions	conditioned responses or reflexes	promotion of adhesion of desired responses to appropriate stimuli
	Reinforcement and conditioning	neutral-passive organism with innate reflexes and needs with their drive stimuli	reinforced or conditioned responses	successive, systematic changes in organisms' environment to increase the probability of desired responses (operants)
	Insight	naturally active being whose activity follows psychological laws of organization	transposition of insights	promotion of insightful learning
COGNITIVE THEORIES OF GESTALT-FIELD FAMILY	Goal insight	neutral - interactive purposive individual in sequential relationships with environment	tested insights	aid students in trial and error, goal-directed learning
	Cognitive-field	neutral - interactive purposive person in simultaneous mutual interaction with environment, including other persons	continuity of life spaces, experience, or insights	help students restructure their life space - gain new insights into their contemporaneous situations

(from Bigge, 1966)

S

 S_1 (assignment) $\rightarrow$ R_1 (inattention, etc.)

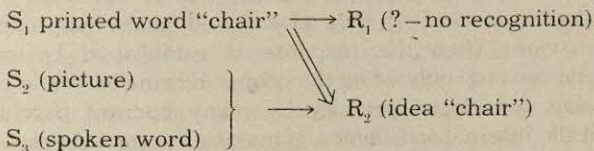
S

The diagram is oversimplified, for inattention to the task is actually a corollary of attention to other stimuli, such as the presence of friends. Suppose now the teacher becomes active with an admonition: "It is too noisy in here. You will have to be quiet and get to work."

 S_2 (teacher) $\rightarrow$ R_2 (?)

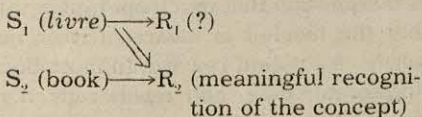
If the dominant response to this new stimulus is concentration on the work, less talking and so forth, all goes well. But sometimes the new stimulus will only serve as a distraction, diverting attention from the work at hand to the teacher's actions. Then the teacher may be forced into a gradually increasing crescendo on the S side while the R of inattentiveness becomes even more deeply entrenched. The harder the teacher tries, the more the pupils learn to ignore. The teacher may then attempt to attach punishments to the undesired R—if you keep talking now something unpleasant will happen to you—in an effort to tip the balance toward the R which was desired. We shall consider this matter of punishment further in our discussion of operant conditioning theory.

On a simpler basis, let us suppose we are teaching the printed word "chair" to a group of first-graders. We might show a card on which the word is printed, at the same time showing a picture of a chair and pronouncing the word. We might even have the children grasp the chairs they are sitting on.



With appropriate repetitions, the printed word comes to call forth the desired response. If there had been no storehouse of knowledge beforehand, the visual symbol might have been associated with the sound, but there would have been no true meaning to the association. This is one reason why children with meager language development have trouble learning to read. They have no adequate sound vocabulary.

We learn a foreign vocabulary in much the same way:



When we learn new words in context, the setting helps us identify the meaning. When we try to learn a vocabulary list, however, there are a number of possible

sources of difficulty. Unless meaning is seen as the word is read, the procedure fails. Note that one must also generate the sound of the French word if that is to be required in future performance. Also, if most of the practice is from the new language to the known language, we will have more difficulty translating from English into French than from French into English; we must practice in the reverse order as well if we wish to be accomplished in that direction.

Teachers who base their thinking on classical conditioning theory tend to play down the importance of motivation and maturation. They concentrate on the presentation pattern—the lesson plan—usually breaking down the content into specific units. Such teachers frequently seem to be more concerned with the mechanics of stimulus presentation and repetitive pairings than with other aspects of the material. It is assumed that the complex responses involved in learning broad concepts are built up from a combination of simpler $S \rightarrow R$ connections. That is, we come to “appreciate” America by starting with the learning of specific facts: Columbus discovered America in 1492.

B. F. Skinner's work on operant conditioning has brought about a change in the theoretical orientation of $S \rightarrow R$ psychologists. Attention has shifted from the S to the R and to ways of regularizing desired response patterns by means of rewards. It can be thought of this way:

($S \rightarrow$) $R \rightarrow$ Reward or punishment

Some preceding stimulus is assumed to be present, but it is the reinforcing condition that follows the response which ensures that the response becomes fixed. Of course, some way must be found to elicit the desired response in the first place. This is not always easy, and at times behavior must be “shaped” by rewarding anything resembling the desired response in the early stages of learning and then, in later stages, rewarding only closer and closer approximations of the “correct” behavior. Then the response is established by repeated presentation of extrinsic rewards only when the proper R is made. While concrete “external” rewards are considered primary by many operant psychologists, Skinner indicates that the internal satisfaction of making the correct response can also be most rewarding. Thus learning to read, for example, may serve as a reward in itself. In programmed instruction, each bit is designed to give the immediate gratification of “I’m right” for the proper response—instantaneous reward.⁷

Teachers have always recognized the value of reward once they paid more attention to the learner than to the teacher as a stimulus presenter. Many of them stress praise, recognition of good work, and the like, on the assumption that these are rewarding—which in fact they are most of the time. Sometimes they are not, however, for there are times when being praised by the teacher brings the disfavor of one's peers. Again, there is no question that much operant conditioning takes place in the classroom, whether the teacher is aware of it or not. Peer acceptance for given responses can serve as a potent reward. In most classrooms, however, rewards are functioning indiscriminately, and teacher-given rewards are especially few and far between for the poor learner.

⁷B. F. Skinner's writings on the application of $S-R$ theory to teaching may be found in his book *The Technology of Teaching* (New York: Appleton-Century-Crofts, 1968).

The use of punishment to discourage the probability that a given response will recur is also possible. This can lead to trouble, however, since punishment is likely to be associated with the giver rather than with the response which is supposed to be eliminated and punishment does not necessarily tell the child what the *right* response is or make him want to make it. Thus, operant conditioning is most effective in the classroom when rewards are emphasized. Unfortunately there is still a great deal of emphasis on punishment in school situations, despite its uncertainties.

Recent work of the behaviorists in actual classrooms has served to highlight two things. First, much that we do to reward or punish backfires because we do not realize what our actions mean to the pupil. One of the biggest classroom problems is the child who is continually acting up—even to the point of staging temper tantrums. It frequently turns out that such a child has an almost insatiable need for attention—and causing trouble is the most convenient way for him to get it. The more attention he gets, the more he is “rewarded” in terms of what he really needs, and the more likely he is to repeat his behavior.

O’Leary and Becker (1967) are among those who have attempted to bring this problem into focus with their work in both regular and special classes. They have shown that the indiscriminate methods now in use often work against our purposes because the reinforcement is attached to the perverse response. To correct this, teachers are trained to give attention, praise, and nearness only when a desired response is made. They are advised to ignore—insofar as possible—all improper behavior and to reinforce instead whatever proper behavior may be present. Thus, if one child is acting up, the teacher praises the child next to him who is attending to his lesson. The expected behavior must be defined with specificity—one is not asked to “be good,” but to face forward, look at the teacher, keep one’s feet on the floor, read the material, etc.

The second thing these behaviorists have demonstrated is that we are overestimating the power that traditional praise has for many children. Social reinforcers are not always adequate. Extrinsic, more primitive reinforcers—more materialistic if you will—seem needed in some cases. Like most adults in this society, children sometimes require direct payment. It has been suggested that when we pay slum children to go to school and learn, the effort will be there. O’Leary and Becker have used trinkets, candy, and money as reinforcers. They have found that these material rewards can gradually be spaced at longer intervals, given for proportionately greater accomplishment, and eventually supplanted by social reinforcers such as praise from the teacher. Other research (Ferster, 1967) suggests that whenever possible natural reinforcers, rather than extrinsic ones, should be employed.

Actually it might better be said that once the child finds that he is able to succeed, success itself becomes the greatest reinforcer. (It is usually necessary to alter the curriculum material significantly so that success is actually possible in these programs.) Such work has shown that gains in behavior generalize from the specific situation to other school conditions. Disturbed children may learn to make a particular rewarded response and also show a generally higher level of cognitive functioning. At least in certain cases and with certain types of disturbance, dramatic changes can be achieved through astute management of exterior conditions without involved psychotherapy. Success, however, is not universal.

Basically, the $S \rightarrow R$ approach tends to consider the organism as passive, if indeed it is considered at all. Learning situations are broken into bits, often unrelated; external rewards loom large. Yet reward is never really given to the response as is implied in the formula. It is given to the organism; the person and nature of the pupil determine what is rewarding, punishing, or neutral. Thus, to be perfectly accurate, our formula should read $S \rightarrow O \rightarrow R \rightarrow \text{Rew}$, though most behaviorists tend to play down the O.

Whether $S \rightarrow R$ adequately describes the basic element in all learning or not, the fact is that pure, elemental stimulus-response learning is rarely seen in human behavior.* This is because human learning inevitably involves the learner's previous experience, and the result is a much more complicated process of associative learning. For this reason much of the basic evidence for various forms of connectionism and operant conditioning has been secured from experimenting with nonhuman subjects in which the effects of previous experience are not so strong.

We may ask ourselves what must occur if stimulus-response learning is to result. Speaking generally, three things must happen. For one thing, the response must bring some type of satisfaction to the learner. If satisfaction is experienced, the bond between the stimulus and the response is *reinforced*. E. L. Thorndike called this the Law of Effect.

Second, it is important for feedback to the learner to occur as rapidly as possible. The longer the interval between response and knowledge of results, the more difficult the learning becomes. Parenthetically, it may be said that schools under traditional patterns of teaching have often been criticized for the time it sometimes takes for feedback (reinforcement) to occur. It is not uncommon for a student to take a spelling test or submit an arithmetic paper and not learn anything about the correctness of his responses for a weekend, several days, or a week, if ever.

Third, repetition is usually necessary, although the amount of repetition required will vary with the nature of the learning situation and the previous experience of the learner. It is thought that repetition makes it possible for the learner to pay attention to different aspects and to discriminate and select from the total situation those particular stimuli that lead to responses which are most satisfying and, therefore, provide the strongest reinforcement.

Attention to perception and cognition

A quite different emphasis is found in what is called the perceptual school of psychology, which has generally focused on the learning of ideas and "cognitive maps" rather than specific overt responses. Here the organism is seen as a most active participant:

$$\left[\int \right] S \leftrightarrow O \rightarrow R$$

*The behaviorists, of course, have found this a sufficient explanation for all learning. See *Human Learning: Studies Extending Conditioning Principles to Complex Behavior*, by A. W. Staats (New York: Holt, Rinehart & Winston, 1964).

Less concern is given to the exact form of the response or to external rewards. In such learning, too, the emphasis is on the entire pattern of the stimulus field [f] rather than on one isolated S. A given stimulus pattern is seen, reacted to, and perhaps restructured by the O. Learning proceeds from global or gross patterns to differentiated parts as understanding progresses.

Gestalt psychologists in particular are concerned with situations which produce insight—perception of intrinsic relationships. Here the learner looks for all the relevant considerations, some obvious and some hidden, and tries to see the overall pattern and meaning. An overview at the beginning may give orientation so that the problem to be solved is seen as a whole and the goal is identified at the start.

It is hard to see how this conception applies to such tasks as learning a foreign language vocabulary unless there are true similarities between the old and the new, but there are many situations where insight is the key. Understanding how an electric motor runs is an example. Such understanding facilitates transfer to other situations as well as aiding in the recall of solutions to specific problems.

If the response is seen as a function of perception, the teacher will need to pay close attention to two aspects of the situation. The first of these is the stimulus field, which must be structured in such a way as to emphasize the points to be grasped. This will be discussed further in Chapter 7. Pupils often “attend to” a complex situation and get nothing at all from it without teacher help. Second are the perceptual processes of the individual perceiver, with his idiosyncratic way of looking at the world. The child’s world is not what is there, it is what he perceives to be there. The cognitive field thus includes both the external and the internal in dynamic interaction. One’s self-expectations or level of aspiration affect his response to a given S. For example, if a pupil is given a set of arithmetic problems to do and sees only frustration and impending failure, he is likely to react by trying to avoid the task. As Combs and Snygg (1959) have put it, the S is perceived and interpreted by the individual and the behavior (R) follows.

The teacher here must take account of cognitive processes (thinking, differentiating, reasoning) as well as motivational ones. In fact, some psychologists emphasize the cognitive activity of the organism more than either the perceptual field or motivational factors. J. S. Bruner, for example, stresses teaching methods which require the learner to think, judge, and be creative. This is the emphasis of the “new” science and the “new” social studies as well as the “new” math.

The teacher using this approach seeks, within the range of pupil maturity, to do two things. The first is to arouse involvement with the stimulus field, and the second to focus on the interaction itself and see what can be learned about the pupil’s way of looking at the problem. Bruner’s use of blank maps in teaching human geography, to be discussed in Chapter 7, is an example of what is meant.

In some first grades the teaching of reading starts with communication of a pertinent experience. A “story” is produced by the children themselves—perhaps a description of a field trip to a farm or some other interesting place. The story is written on the board by the teacher as the children relate it. Only then does attention turn to the individual words that make up the story. It is important, however, that the teacher not lose sight of the fact that being able to read means knowing specific words and being able to recognize them in other contexts as

well. He must be sure the task is carried to the point where all the details are adequately absorbed.

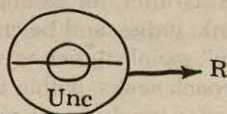
"Bit by bit" learning is discouraged by the perceptual psychologists. They aim for responses that are broad and based on insight, rather than narrow and specific. Only if the general principles are understood can a response be tailored to the needs of individual situations. There is, of course, a danger that the learning experience may remain too global and diffuse if only general principles or abstractions are taught.

Much of the flavor of the progressive approach outlined by John Dewey is found here. It is based primarily upon the concept of a meaningful interaction of the student with the environment. The changes in the student which come about as a result of this experience constitute learning. This type of approach is being advocated today under such rubrics as "learning by discovery," which will be discussed in a later chapter.

Depth psychology

Some psychologists would move even farther toward an internal determinism. They concentrate on things that cannot be seen or even formulated in specific terms—motivation on the unconscious level, drives and urges of which we may not even be aware. The ego phenomenon and cognitive processes are seen as having their genesis in these underlying factors.

Why does a pupil fail to do his work? Because the reward is not significant? Because he can't understand what he is supposed to do? Sometimes, perhaps. But he may be reacting to deep anxiety, a sense of inadequacy. Or he may be hostile and defiant despite a surface compliance or apathy. As one pupil finally put it, "I know what you want and I like the candy but I won't do it anyway." He may be displacing feelings about his parents onto the teacher. Seldom is the true nature of an event exactly what it seems on the surface. Some depth psychologists go so far as to presume that nothing is what common sense would predicate, that every response has an internal determinant, thus:



This approach has of late received much criticism, such as the following by Hobbs:

Freud has led us to a preoccupation with the intrapsychic life of man. No, I think "obsession" is a better word to suggest the passionate commitment we have to the world inside a man's skull, to the unconscious, the phenomenal. . . . Everyone must become a therapist, probing the argument of insidious intent. . . . (1964, p. 823)

On the other hand, a teacher who is not aware that frontal attacks on motivational problems often fail is in for some hard times. Rewards and punishments are

dependent upon the state of the organism. It is rewarding to have food put in your mouth if you are hungry but punishing if you are satiated to the point of revulsion. To be cared about too minutely may even be punishing if you need to establish your independence. An "A" in student teaching may be a mixed gratification if you are unconsciously ambivalent about wanting to teach.

Even the stimulus is to some extent at the mercy of the internal state. If you are frightened at night, little noises become loud without any actual change in output. An angry boy may not notice the teacher's kindness. A frightened, phobic child is superattentive to hurtful portents in a classroom. Basic appetites vary in level, becoming satisfied and reactivated. There is an increase in restlessness before lunch and before the freedom of the last bell. Our perception of the world is shaped by long-term fear, hatred, affection, and trust.

While there are some who would make all teachers and parents operant conditioners, others are inclined to espouse the clinical route. The pupil's projection of inner life into his compositions, art work, and even career interests are not seen as happenstance but as of central importance for understanding and guiding a child. More will be said about this in Chapter 10. For the present it is sufficient to recognize that this approach has something to offer the teacher, without implying that teachers should become therapists. Some of the general implications were drawn in the discussion of teacher and pupil needs in the opening chapter.

There are various possible explanations for all types of behavior. Forgetting an assignment may represent the press of other activities more interesting or more important to the pupil, or it may be an active process—repressing the knowledge for unconscious reasons. Recall is always involved with feelings of one sort or another which enhance or discourage future recognition. The child avoids that which makes him anxious about possible failure. There is an "irrational" portion in all our behavior. One often wonders why a child—or an adult—persists in behavior which seems to get him nowhere. The answer, of course, is that it *does* get him somewhere: it is reasonable in terms of his unconscious drives. He does that which gets him punished because punishment helps him handle his unconscious guilt.

A. T. Jersild long ago pointed out that educators have tended to ignore the most important parts of life—love, anger, fear, and the like. Certainly in the present period of interpersonal, mass, and even national aggression, one cannot hide behind a claim of rationality. If for no other reason than to counterbalance an "other-directed" trend, the depth psychologists have an important message in leading us to think of the role these emotional states play in our behavior. Managing our impulses is one of our most pressing problems. As human beings we seek meaningful relationships and intensive experiences which touch off depths of feeling; we find them in one way or another, in interpersonal relationships or in "pot" and LSD.

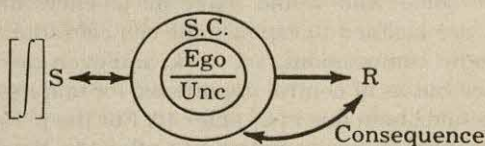
These psychologists would have teachers be as concerned with the self-concept of each pupil as with his academic learning. What are his values? Can we provide him with a worthy model to identify with? Where can we enhance his creativity and uniqueness? How can we help him become socialized? How should we deal with his affections and his hatreds? Certainly, we must first "know ourselves," for teaching is an interpersonal occupation.

Summing up

For a comprehensive view of the classroom learning situation, we must incorporate aspects from all of the theories discussed above. $S \rightarrow R$ becomes more complicated, as suggested by the diagram below.

The elements of this diagram are elaborated in the chart. A teacher can appreciate that sometimes the stimulus will be a field, a complex phenomenon, hence [f]. The nature of certain subject matter calls for this—un-

ELEMENTS OF LEARNING IN THE CLASSROOM SETTING



[f]

Broad Stimulus Situation:

- (1) External Pressures—influences from community, class, family
- (2) Overall school climate, overall educational goals
- (3) Teacher style
- (4) Peer influences, norms, group dynamics
- (5) Intended stimulus field, a broad task

S **Specific Stimulus—Given learning task:**

- (1) As seen by teacher, and broken into units
- (2) As seen by the learner, what he actually sees as what is to be learned

**The Organism:**

- (1) Self concept—person's perception of himself, and his self-esteem
- (2) Ego level: Pupil's conscious goals, motivation and experiences as staged, stimulated and organized by the teacher utilizing learning processes.
- (3) Organic Components: Maturity level, intellectual and other abilities
- (4) Unconscious: Deeper needs, aspects of esteem, underlying feelings, resistances, etc.

R **Responses—the learned behavior:**

- (1) Planned behavior changes as observed, measured, appraised by teacher
- (2) Pupil self-recognition of changes
- (3) Covert behavior changes

C **Consequences:**

- (1) Direct rewards, punishments
- (2) Feelings of satisfaction, self-esteem, failure
- (3) Feedback to pupil and teacher for future efforts

derstanding the "why" of the Civil War, for example. At times the teacher will be acting, in one way or another, to restructure the S in an effort to help the pupils make sense out of it. In other cases the S will be quite specific.

The O is the most complex element. For our present purposes, we can think of the self-concept (SC), the individual's picture of himself, as the outer portion of the O, surrounding the ego and the unconscious. We are here using the term ego to indicate all the conscious mental processes of the individual: thinking, combining, creating, and intellectual appraisal. There will be conditions of learning where these aspects of the O are dominant. There will also be instances in which the unconscious (Unc) is central. Here are the needs, both known and unrecognized. Sometimes the best-presented S and the proper rewards fail because the pupil is dominated by anxiety, fear, or anger, which even he does not understand. On the other hand, there will certainly be many times when reinforcement will tip the balance. Astute use of gratifications will be effective in encouraging application. But the teacher will need to know through understanding of the particular "O" what is really rewarding and what is not. Solomon and Yaeger (1968) have suggested that individual children will often interpret "neutral" comments in positive or negative terms. There are times when even candy will not facilitate learning.⁹

It is currently popular to identify with one or another position and orient all conditions and explanations around this, whether they all fit well or not. In practice, teachers find this an obstacle rather than a help. For example, if one is teaching a child to recognize printed words, and the child is old enough, able enough, interested in learning, and attentive to the task, the teacher may need only present the S to insure the proper R. Teaching is simplified. But such cases are infrequent. There are youngsters and oldsters who do not care or who think they cannot learn, who are defensive, who are easily distracted, who require special attention. In fact, it has been said that a teacher's real work begins where a simple presentation of the material leaves off. Motivation and management skills become essential. Teaching is a many faceted thing.

There is also the question of what is to be learned: that is, what change do we seek in the organism? Just as a singer may learn to make sounds in a foreign language without understanding the words, youngsters may recite a poem without any realization of its meaning. Does more profound or complex understanding result from an accumulation of simple associations? Does one develop empathic feeling by defining empathy? Or is it by identification with an adult who is empathic? The expectations for formal education are very high: to turn out individuals who can cope with the personal and social problems which confront them, apply knowledge to new areas, take a responsible part in civic affairs. Considering the wide range of learnings necessary to success, it would appear we are not yet ready to say that any single present theory accounts for all of them.¹⁰

⁹See "An Experimental Reading Program for Neurologically Impaired, Mentally Retarded, and Severely Emotionally Disturbed Children," by F. M. Hewett, D. Mayhew, and E. Rabb (*American Journal of Orthopsychiatry*, 1967, 37, 35-48).

¹⁰F. J. McDonald points out that we still must be eclectic in this matter. See "The Influence of Learning Theories on Education (1900-1950)," Chapter 1 in *Theories of Learning and Instruction* (N.S.S.E. 63rd Yearbook, Part 1. Chicago: National Society for the Study of Education, 1964).

Finally, we can see that growth and learning are not completely separate spheres. The child changes as he grows and as he learns. We saw in the developmental chapters that some psychologists put more emphasis on the environment while others are more attentive to the unfolding of the organism, believing that there are deep motivations whose essence cannot be changed though their expression may. Teachers have much cause for thought about what human nature is as well as what types of change are possible and desirable.¹¹

Reading Ernest R. Hilgard

A PERSPECTIVE ON THE RELATIONSHIP BETWEEN
LEARNING THEORY AND EDUCATIONAL PRACTICES

The finest theory in the world is of little use until it is effectively put into practice. In this selection Ernest R. Hilgard, a widely known authority on the subject of learning theory, outlines the continuum between pure and applied research. He discusses the mechanics of putting theory into practice and the hazards of skipping over intermediate steps.

The relationship between learning theory and educational practices is that between any pure science and its technological applications. In the process of application something more than the theory is always involved. Thus, one does not move directly from astronomy to navigation without concern for tides, prevailing winds, and the location of lighthouses; investigations of heredity in fruitflies do not lead immediately to applications in animal husbandry without concern for the resistance of cattle to disease, the desirable characteristics determined by the market, and many other considerations; advances in the chemistry of fuels do not automatically determine whether a manufacturer will favor compact cars or full-sized ones, with engines in the front or in the rear. It is no different with educational practices, for these practices are determined by educational objectives, by the demands of mass education, by community resources, as well as by the teachings of psychology. In this chapter, I propose to examine some aspects of the contribution of learning theory and of experimentation on learning to the technology of education. . . .

From *Theories of Learning and Instruction*, Sixty-third Yearbook of the National Society for the Study of Education, Part 1. Chicago: Distributed by the University of Chicago Press, 1964. Reprinted by permission of author and publisher.

¹¹An excellent volume with brief and cogent essays on these issues is *Learning about Learning: A Conference Report*, J. S. Bruner, Ed. (Washington, D.C.: U.S. Department of Health, Education and Welfare, 1966).

Some faulty conjectures

First, I should like to dispose of some assertions which, if not often made, are sometimes implied.

1. *"We cannot expect to have instruction scientifically based as long as learning theorists are not in agreement."* If one were unable to proceed without a learning theory upon which all agreed, the situation would indeed be frightening. At least two things need be said. For one thing, the disagreement among theorists may be in respect to the interpretation of a set of facts upon which, as facts, all agree; in this case, the issue often is not one to trouble the practical person at all. Thus rewards may control learning in a given situation and be interpreted in contiguity terms, in reinforcement terms, or in information terms. While eventually the correct interpretation might make some difference, it often makes little difference at the present stage of technology. . . . Second, the technology of instruction rests on much more than learning theory.

2. *"Once learning theory is in order, the principles of instruction will flow from it."* Technology must respect theory, in that it cannot violate fundamentally established principles, but theory never dictates technology directly. Learning theory will not dictate instructional practices any more than the principles of thermodynamics dictate whether airplanes shall be driven by propellers or jets. . . .

3. *"The learning theorists are quarrelsome, but psychological experimentation is sound. If we know the experimental literature, then we can base our instruction upon it."* This is a tricky matter, for several reasons. For one thing, experiments are often guided by (and limited by) theory. That is, a test of a given theory is usually conducted with the constraints appropriate to that theory, and may not be fair to other theories that would favor different constraints. Hence, the facts do not "speak for themselves." For another, experimentation goes on at various levels and at various degrees of relevance to educational practices. Even those experiments which appear to be most closely related to instruction may not be generalizable to other instructional situations. Ignorance of the literature is not, therefore, the trouble in trying to apply learning theory to education.

4. *"Because we can't wait for the learning theorist to finish his job, and because learning theory will not in any case tell us what to do, we might as well ignore the learning theorist."* Things are not as white or black as this; learning theory is quite likely to be useful even if it is not directly determinative of practice. One can think of other parallels. Historians, for example, despair of finding general lessons of history, yet they argue fervently that a political leader is better off if he is informed about history, for he can, in fact, learn something from it. Learning theory is likely to produce some economy in educational experimentation by suggesting directions in which answers can be sought, thus saving a wasteful empirical search. In the end, a practice must work, but if we guide our search for workable practices by theoretical considerations, we may save a great deal of time and effort along the way.

5. *"Psychologists know plenty about learning; educators know the problems of the schools. If only we could get them together, to talk to each other, most of our problems would be solved."* How many half-truths there are! Collaboration is needed, but its terms have to be specified. A few week-end conferences between psychologists and educators are not going to do the trick. The collaboration must

be on long-range investigations, in which the search is conducted together. We do not know the best specifications for team research, but a variety of skills and experiences have to be brought together among people who understand each other as they face a common task. They have to learn from each other, so that part of the synthesis goes on in individual minds.

6. "Teaching is an art, and we can learn more from good teachers than from any experiments we are likely to design, or from what any psychologist says about teaching." Of course we can learn from skilled teachers, and it is true that some good instructional practices are invented rather than discovered in a laboratory. . . . But to throw away all the possibility of improving instruction through carefully designed studies would be like returning medical practice to the prescientific physician because we still value the bedside manner.

These assertions are highlighted to show that a problem exists and that we should try to think as clearly as we can about it in our attempt to establish a sounder relationship between theory and research in psychology and educational practices.

Steps on the road from pure-science research to established educational practices

In order to avoid the sharp distinction between pure and applied research, I find it convenient to break up the stages from the "purest" of research on learning to the most "applied" research (that concerned with the adoption of an approved practice) into six steps according to their relevance to the educational enterprise. Three of these are placed within the "pure science" end of the continuum, three of them in the "educational technology" end, as shown in Figure 1. The steps are abstracted from what is, in fact, a continuum; any one investigator may work at once upon several of the steps, or in the areas in which the steps shade into each other. The roles become increasingly diverse as the steps become farther apart. While the diagram is self-explanatory, its two halves call for some added comments.

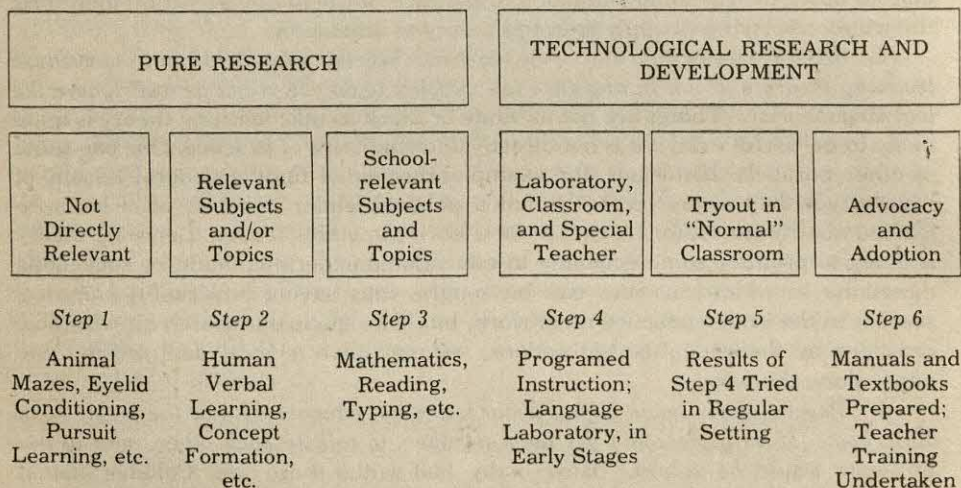


FIG. 1.—Steps in research on learning—pure research to technological development

Pure-science research on learning By pure-science research is meant that which is guided by the problems which the investigator sets himself, without regard for the immediate applicability of the results to practical situations. This does not mean that the investigator has no practical interests, or that he does not want his results used; it is only that he is patient and uses the methods and procedures appropriate to the topic on which he works. Within learning research we may divide the stages of relevance to learning into the following three, expanding somewhat the left three boxes of Figure 1.

- Step 1. Research on learning with no regard for its educational relevance, e.g., animal studies, physiological, biochemical investigations. Learning in the flat-worm and learning in the rat with transected spinal cord classify here.
- Step 2. Research on learning which is not concerned with educational practices but which is more relevant than that of Step 1 because it deals with human subjects and with content that is nearer to that taught in school, e.g., nonsense syllable memorization and retention. The principles being tested are likely to be theoretical ones, such as the relative importance of proactive and retroactive inhibition.
- Step 3. Research on learning that is relevant because the subjects are school-age children and the material learned is school subject matter or skill, though no attention is paid to the problem of adapting the learning to school practices, e.g., foreign language vocabulary learned by paired-associate method with various lengths of list and with various spacing of trials.

These three steps of relevance all classify as pure-science research because the problems are set by the investigators in relation to some theoretical issues and do not arise out of the practical needs of instruction. Of course there may be bridges from any pure-science project to a practical one: perhaps drugs discovered in brain studies of rats may aid remedial reading, studies of interference may suggest intervals between classes or what should be studied concomitantly, and language-vocabulary results in a pure context may guide language acquisition in schools. The main point is that the scientist has not committed himself to relevance. . . .

A further word on Step 3 is in order. The best work will be done at this stage by combining the skills of the subject-matter specialist with those of the experimenter upon learning. I have in mind combining the work of linguist and psychologist, as in . . . the combination of experts in mathematical learning theory and linguists in the work of Suppes, Crothers, Weir, and Trager (1962).

A brief characterization of the report by Suppes and others will be useful in showing some of the characteristics of Step 3 investigations. The authors consist of a logician sophisticated with respect to mathematical models, a psychologist whose work lies particularly in the field of mathematical learning, and two linguists. The studies, which concern the teaching of the Russian language, used actual language students, working in the familiar setting of the language laboratory in one of the local junior high schools. The material to be studied was prepared with the aid of a linguist familiar with the structure of the Russian language, so that certain conjectures about linguistics could be studied at the same time that learning theory was being investigated. The discriminations called for were real ones

— Russian words being spoken into the tape by someone fluent in Russian. Contrast this with the usual preparation of a list to be memorized in the laboratory! Without going into detail, let me indicate the kinds of things that come from such a study:

1. Linguists have offered some conjectures about which combinations of phonemes can be most easily identified and how easily allophones can be recognized. (An allophone is a phoneme that is acoustically a variant: the phoneme that is represented by the letter *p* in English is not equally explosive in *speech*, *peach*, and *topmost*. Hence these three *p*'s are allophones.) The investigation gave evidence that most of the conjectures of the linguist were indeed correct. A native speaker has no trouble in hearing two allophones as the "same" phoneme, but the student hearing a foreign language has a great deal of trouble, and in constructing a good program these details are important.

2. The effort to work up by small steps from the easier combinations to the more difficult ones, which seemed plausible enough from the theory of programming, turned out not to be advantageous. The students who received random presentations from the start did somewhat better than those who had the orderly progression from easy to difficult.

3. The mathematical model that proved to fit these data best was a two-stage model, as though learning took place in two jumps from no learning through an intermediate stage to mastery. What this means in terms of the underlying processes is not yet clear; it may mean that first comes a stage of discriminating the stimuli and responses, and then a stage of connecting them.

My reason for placing this investigation at Stage 3 is that it is essentially a pure-science project, concerned with phoneme-allophone discrimination, on the one hand, and mathematical models of learning, on the other. Its relevance to classroom learning comes about because of its choice of subjects, laboratory conditions, and subject-matter. It is close to the technology of instruction but is not yet designed to indicate just how Russian should be taught. The order of presentation (increasing difficulty *vs.* random difficulty) is the most technologically relevant of the suggestions coming from the study, but this has to do with only a small aspect of learning Russian and requires more substantiation before it can be generalized. At the same time, it is fairly obvious that experimentation closely related to the instructional task is likely to bear educational fruit more quickly than experiments classifiable within Steps 1 and 2.

Applied or technological research and development We are ready to consider what happens on the right-hand side of Figure 1, in the steps having to do with applied- rather than pure-science research. The steps may be described as follows:

Step 4. Research conducted in special laboratory classrooms, with selected teachers, e.g., bringing a few students into a room to see whether or not instruction in set theory or symbolic logic is feasible, granted a highly skilled teacher.

Step 5. A tryout of the results of prior research in a "normal" classroom with a typical teacher. Whatever is found feasible in Step 4 has to be tried out in

the more typical classroom, which has limited time for the new method, and may lack the special motivation on the part of either teacher or pupil.

Step 6. Developmental steps related to advocacy and adoption. Anything found to work in Steps 4 and 5 has to be "packaged" for wider use, and then go through the processes by which new methods or procedures are adopted by those not party to the experimentation.

It is evident that the mood has changed in the transition from pure-science research to technological research, although the distinction between Steps 3 and 4 may be slight under some circumstances, as indeed in the experiment by Suppes and others used in illustration of Step 3. . . .

If one were to review the relationship between experimentation on learning by psychologists in its relation to education over the past several decades, it would be fair to say that too much of the research has rested at Steps 1 and 2 to be educationally relevant; educational psychologists, too, have tended to work at this end of the spectrum and then to jump, by inference, to Step 6, without being sufficiently patient about Steps 4 and 5. In this respect the introduction of programmed learning has been helpful, because of the serious concern both with the structure of subject matter and with the individual learner for whom the program is designed. . . .

A set of strategies for integrating the psychology of learning with the technology of instruction

Dividing the spectrum of pure and applied research into the six steps, three "pure" and three "technological," is descriptive of a problem, but it does not prescribe a program, except to invite good work all along the line. I wish to consider the same set of problems from a slightly different vantage point: the strategies that are involved with the aim of emerging with a scientifically based technology of instruction.

Strategy of discovery and invention Discovery is the task of pure science, and the scientist in his laboratory must be free to perform this task in his own way. From the point of view of education, we need to make the approach to the spirit of pure science but need to direct it to relevant contents. There is no reason why we should not seek to have more experimentation on school children in the learning of subject matters or necessary skills or the kinds of problem-solving that are likely to go on in school.

While assigning *discovery* to the pure-science end of our continuum of relevance, we must not overlook *invention*, which is by no means limited to scientists. Some promising advances in education have come about as the inventions of skilled teachers, and a technology of instruction needs to examine and conserve the values of these inventions. I think, for example, of the augmented Roman alphabet being tried out in England in order to gain the advantages of a purely phonetic reading and writing in English. This seems to be meeting with great success; I should call it an invention rather than a discovery. One might say

the same of O. K. Moore's use of an electric typewriter with beginners in reading and writing. Pure scientists are inventive in the realm of ideas but not always in the realm of technologies. As one of my colleagues is fond of pointing out, an Einstein does not take out patents; an Edison does. We need both kinds, and this is an added reason why the psychologist whose work is to be relevant to education needs to be close to educators and teachers.

Strategy of development of methods, materials, and procedures At another level of science, this time applied science, we need those who will be concerned with the utilization of the discoveries and tested inventions from the investigations that have been described. This is not a matter of taking some principle and applying it in cookbook fashion to the subject matter of schools. We have had too much of this in the past. For example, when Thorndike emphasized the significance of word counts as giving order to what is taught in reading, the very plausible notion that the more frequent words should be taught first became a fetish in the construction of some elementary-school readers. This was a scientific aid to textbook construction, to be sure, but the further steps in development were not taken. Whenever they were taken it was found that, in context, pupils could learn words that were considered too difficult on the basis of the frequencies from word counts. Now there is a kind of revolt against the artificiality that has crept into the substance of much of our reading material, and an effort is being made to revitalize it.

As soon as the more practical step is taken seriously, it becomes obvious that the psychologist cannot work alone. There is a structure to knowledge, so that later steps depend in part upon earlier ones. There are discriminations to be made. Theories gain their support from selected facts of a particular kind, so that what kinds of facts are taught may establish the readiness for theoretical interpretations. Much of this lies outside the psychology of learning and in the realm of the subject-matter expert—the mathematician, the physicist, the biologist, and sociologist, the historian, the artist, the musician, the linguist. The serious interest being taken in the schools today by the scholars within the various disciplines is encouraging, but they can no more go it alone than the psychologists can go it alone. The emphasis upon the intellectual in education is fine, but it can easily produce, in new form, the old misunderstandings that gave rise to exaggerated theories of formal discipline. The subject-matter specialist is likely to think that his material is fundamentally so interesting that as long as it is arranged logically, and is comprehensible, the psychological problems will take care of themselves. This is no more true today than it ever was. This subject-matter expert has an essential role, but his collaboration with the learning expert is equally essential.

As long as the experimenter upon learning used artificial tasks, such as mirror-drawing, finger-mazes, pursuit rotors, and lists on memory drums, he could suit his own convenience; once he decides to program symbolic logic or the Russian language or the appreciation of poetry, he has additional constraints upon him. He finds it necessary to collaborate not only with subject-matter experts but to make use of the experience of skilled teachers. One of the first lessons of program development is this: A good program is not developed out of the mechanics of program construction or out of familiarity with the psychology of learning; it is not developed out of subject-matter expertness, nor through the sheer artistry of an able teacher; it requires the collaborative effort contributed by

the various expertnesses. Once a reasonably promising program is developed, it has to be tried out in a classroom, perhaps a laboratory-type classroom, but with real school children taught by a real teacher. Then, before the development is completed, it has to be tried out in a regular classroom, where other obligations also exist. A teacher has many responsibilities, and children have diverse interests; whatever is new has to be fitted in somehow within an existing set of classroom procedures. These steps are all rather foreign to the typical experimental student of learning, but they are essential if the educational program is to be sound. I would argue for a division of labor and prestige, so that those who take on the developmental task are recognized and honored for the ingenuity they display, which must be at least equal to that of the pure scientist.

Strategy of innovation In something as complex as a school system, we need another level of research strategy, which I shall call *the strategy of innovation*. The best of equipment may lie idle, the best of resources remain unused, the best of techniques sabotaged, if there is not care in introducing the new methods or new materials to all concerned. Once the pure-science principles have been established and the applications validated in practice schoolrooms, the more widespread adoption is by no means guaranteed or, if the adoption is forced there is no assurance that the desired results will be forthcoming. Abstractly, the steps of innovation are clear enough: Provide (a) a sound research-based program, validated in tryout, (b) the program packaged in such a way as to be available, as in good textbooks, supplementary readings in the form of pamphlets, films, programs for teaching machines, and guides for the teacher, (c) testing materials by which it can be ascertained if the objectives of the program have indeed been realized, with appropriate normative data on these evaluative instruments, (d) in-service training of the teacher to overcome the teacher's resistance to something new and to gain his enthusiastic acceptance of the program as something valuable as well as to train him in its use, and (e) support for the program from the community, school boards, parents, and others concerned with the schools.

It is my feeling that we have not done very well in appraising carefully our strategies of innovation. We have sometimes gone overboard for the novel and untried, just to keep up with the Joneses ("we have teaching machines, too"); at other times we have been very resistant. Commercialism and vested interests enter in unpleasant ways, sometimes supported, unfortunately, by fractions of the educational profession itself. Here, then, is a task calling for wisdom and sensitivity. The psychological contributions may come more from social psychology than from the psychology of learning, because the processes are those of social control and attitude change; but unless there is serious concern about the appropriate ways in which to bring innovation about, schools are likely to be the victims of whims, rather than the heirs of the best tradition we can establish through co-operative effort.

There are some specific suggestions that might be given consideration. It would be desirable, for example, for every school system, of whatever size, to have somewhere within it a school building, or at least a set of schoolrooms, devoted to in-service training of teachers and to innovation; these are on-going matters important at the community level and cannot be left to teacher-training colleges or universities. Both children and teachers could be rotated through

these rooms in order to try out innovations before there is firm commitment to them. Thus, a few teaching machines or closed-circuit television projectors could be tried out without investing in them for a whole school system; teachers could have a voice in saying whether or not they wanted the new devices, or in selecting among various possibilities. Usually no harm would be done in waiting for a while if teachers were not ready, for methods imposed on teachers are unlikely to prove successful. Some of the innovations to be tried out might be those of successful local teachers themselves, here given the opportunity to show their colleagues how they do it in their own classrooms. Members of the school board and representatives of the parents could be brought in also to see things being tried out. The principles of tryout before acceptance, of choice by those who are to use the method, seem to me sound ones. If the new methods are indeed good, they will find acceptance.

The remarks that I have made reduce to this: In order to build a sound bridge from the experimental studies of learning to the classroom, we need a series of steps, for applied science consists of more than applying principles to practice. The main points are that in the research and development phases a collaboration is called for between psychologist, subject-matter specialist, and teacher; beyond this, careful consideration has to be given to techniques of innovation. If we achieve success in integrating these phases, we will move toward that improvement of education which will be satisfying to us all.

LEARNING IN THE CLASSROOM

There is an old, old story about a boy who persisted in saying "I have went" despite the teacher's valiant efforts to teach him the correct form. Finally one day she kept him after school and told him to write "I have gone" a hundred times on the blackboard. She was out of the room when he finished. On her return she found this note: "I have wrote I have gone 100 times and I have went home."

What was wrong? Why didn't the boy learn? Would another child have learned from the same situation? Would this boy have learned under other circumstances? Why do some children learn from one situation and not from another? How can two children learn different things from the same situation?

As we saw in the last chapter, the school learning situation is an extremely complex one. In the remaining chapters of this book we shall be examining the various elements that come into play in the interaction of teachers and learners. The diagram on page 195 presents an overview of these elements and the relationships between them. If you refer to it frequently in your study of later chapters, you will find it easier to see how the individual sections and topics fit into the overall picture.

THE NATURE OF LEARNING

In Chapter 6 learning was defined as changes in behavior that involve perceptual, intellectual, emotional, and motor components. We saw that although psychologists may not agree on basic theoretical explanations of the learning process, there is consensus on the multidimensional nature of human learning.

Translating the theories and experimental data of the psychology of learning into useful principles for guiding classroom learning is not easy. In fact, today there are areas of learning theory in which it is impossible to say what indications there may be for the complex task of teaching. Nevertheless, there are some

guidelines that enjoy wide acceptance among psychologists and also are important to the teacher's work.

The first of these is the multidimensional nature of learning which we have already mentioned. The second is the principle that all learning is a product of experience. Experience, in this sense, means the interaction of the learner with his environment. To some people the statement that all learning comes through experience may seem a simple truism, yet many teachers act as if they never heard of it, or at least do not accept its validity or importance.

The third principle emphasizes the importance of the learner's purpose. This, too, on first glance may seem self-evident. Yet, more often than we would wish, in many classrooms it is the teacher's purpose that is dominant and the lack of involvement of learners goes unnoticed except when trouble breaks out.

In the three sections that follow we will consider in some detail what these principles mean for the teacher and his work.

Learning is multiple

Suppose you are visiting an upper-elementary classroom in which some of the children are experimenting with electric magnets, bells, and other simple devices. Spread out on a worktable are dry cells, wire, a push-button switch, and a bell – all the equipment the group needs to construct a simple doorbell circuit.

A boy named Scott takes his jackknife and strips the insulation from the ends of the wires and sets about attaching the wires to the terminals of the switch and the bell. When the wires are connected, the group members take turns pushing the button to ring the bell. Then a boy removes the covers from the button and the bell so that they can examine them more closely.

This is what you saw as you watched the children at work. But what was *really* going on? Take Scott, for instance. What was he learning? Scott saw that pressing the button brought two metal parts together, and when these parts touched, the bell rang. When the pressure was removed, the metal parts sprang apart and the bell stopped ringing.

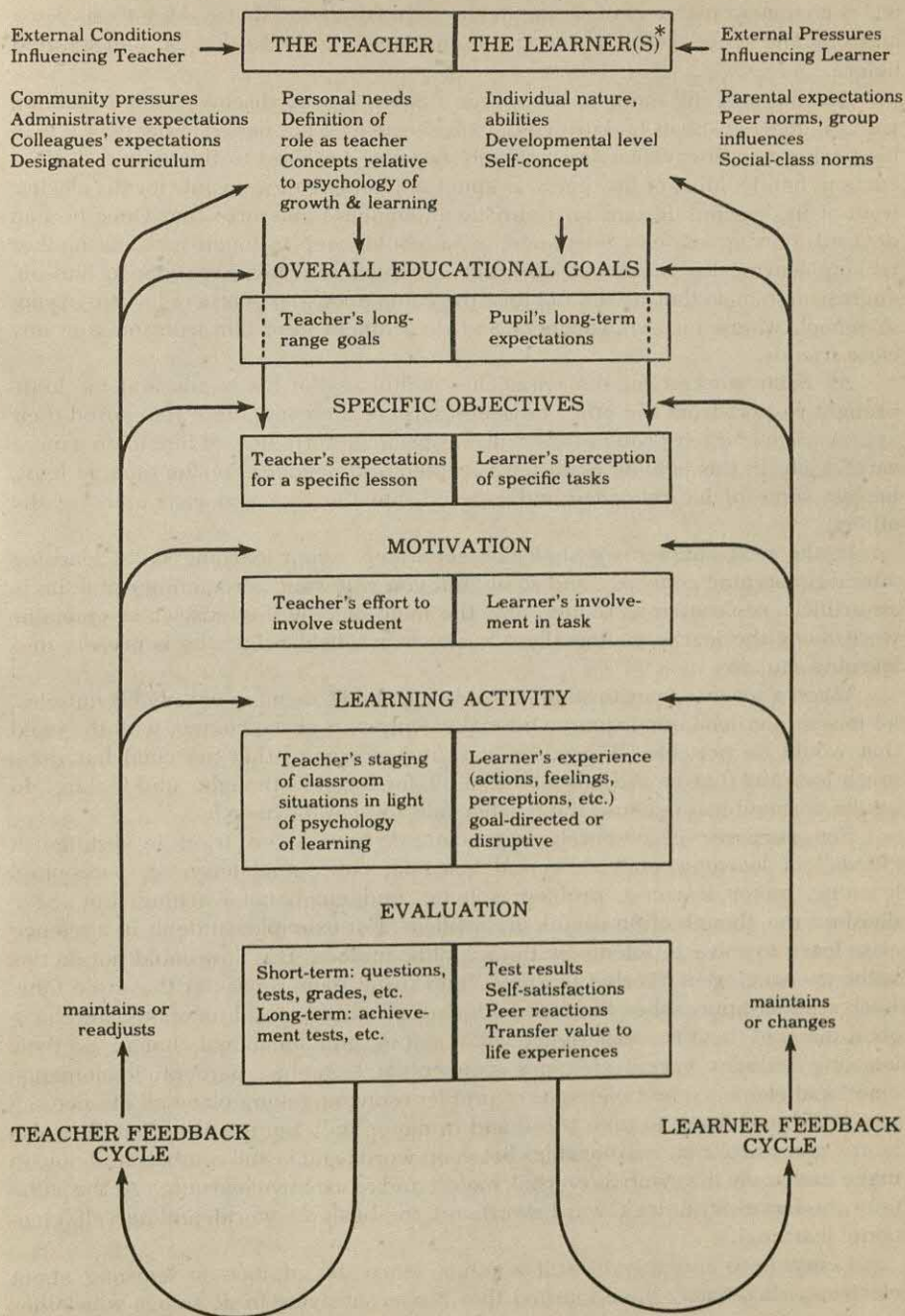
Seeing this work before his eyes helped him to understand what he had read a short time before in his textbook – that electricity will flow only through a closed circuit. His understanding here was a two-way street. Having read the material first helped him to understand what he saw taking place between the button and the bell.

Many concepts and generalizations that he had learned in the past affected what he perceived in the new experience. Scott had been familiar with the concept of electricity ever since early childhood. Before studying this unit in school, he knew electricity as something invisible that flowed along wires and lighted lamps, made toast, rang doorbells, and powered his electric train. But it was now for the first time that he understood just why his electric train would not move when there was a loose wire.

After he had seen the doorbell circuit in operation, his mind leaped to the wall switch that operated the overhead fixtures. He visualized how the lifting of that switch must close a circuit within the walls to light the room.

While learning new concepts and generalizations, he also was learning new

THE CLASSROOM TEACHER-LEARNER PARADIGM



*Note that this is replicated for each pupil.

ways of looking at electrical circuits. He was strengthening his interest in design and mechanics and his skill in handling electrical equipment. Thus his learning was a change in his ways of seeing, feeling, thinking, and doing. And it was using and building on concepts, perceptions, attitudes, and skills that he had learned before.

But there is still more to the story of Scott, as you discover later in talking with the teacher. Scott had drawn the job because he happened to have a knife in his pocket. He always carried his knife because he liked to tinker and it often came in handy. Most of his time was spent in planning new layouts for his electric train or in drawing designs for futuristic automobiles and airplanes. Once he had devised a string-and-can telephone so he could keep in touch with his mother without leaving his basement work corner. Such activities kept him to himself, engrossing him so that he did not miss the companionship of others his age except in school, where his awkwardness and detachment kept him from making any close friends.

As Scott worked on the wires, his skillful use of his hands and his knife brought respect from the other boys and girls in the committee. He sensed their appreciation and felt proud of his skill. His pride, in turn, helped him to do a more careful job. In this activity Scott felt accepted and needed. For the time, at least, he lost some of his reticence and entered into the free and easy spirit of the others.

In the next chapter we shall talk separately about learning skills, learning attitudes, learning concepts, and so on, but you will want to remember that this is an artificial separation as though only the mind or only the muscles or emotions were doing the learning. Actually it is always a whole Scott who is present in a learning situation.

When a teacher tries to stimulate only the child's memory or only his muscles, he misses a crucial opportunity and makes only part of the contact with the child that would be possible. Worse, he may find afterward that the child has done much learning that he did not intend at all, for a child's thoughts and feelings do not lie dormant just because the teacher fails to plan for their use.

For purposes of research, psychologists have often tried to distinguish "kinds" of learning such as verbal learning, conceptual learning, perceptual learning, motor learning, problem solving, and emotional learning, but these divisions too, though often useful, are artificial. For example, students in a science class learn to solve problems by the scientific method. But they could not do this without engaging in "verbal learning" and using their senses at the same time. Each student approaches the task with certain attitudes and emotions, and for a good many of them the experience will result in some emotional change. So their learning includes verbal elements, conceptual elements, perceptual elements, emotional elements, and elements of problem solving, taking place all at once.

A girl may learn to take shorthand (a motor skill) but this is not all. She also learns many arbitrary relationships between words and visual symbols and how to make and apply the symbols (verbal, motor, and associative learning). At the same time she learns attitudes toward shorthand, the business world, and herself (emotional learning).

Learning is multiple in still another sense. In addition to learning about electricity, Scott may have learned that it was satisfying to do things with other

people, that it was easier than he had thought to mix with other people, that others could see him as adequate and intelligent. If this particular job had not fallen to Scott and he had not been brought into the activity so completely, he might have learned a feeling of impatience for someone who could not do the job as easily as he, a greater sense of detachment from his age-mates, or other ways of occupying himself while the rest of the committee worked. These learnings are sometimes called "concomitant" or "incidental," but they may be central to the learner. Learning about electricity—or fractions or history—may be incidental to him.

Learning comes only through experience

Learning is not something a teacher can do *for* children. Nor is it something he can *give* them. Even knowledge he cannot give them directly. Any person's knowledge is the result of his own learning, his own perceptions. He can learn only through what he himself experiences.

We sometimes talk about "learning" and "knowledge" in the abstract. This can be misleading, for they do not exist apart from a *person*. We need to be more specific. Joe's knowledge, and the teacher's, and Scott's are all "knowledge" but they are not the same. Joe's knowledge is the result of Joe's experience and Joe's learning; the teacher's is the result of his experience and his learning; Scott's is the result of his experience and his learning. This seems obvious, yet some teachers tend to regard knowledge as "segments of reality" which the learner somehow can swallow whole and regurgitate on demand. In such a process what the learner *experiences* is seen as irrelevant.

You probably learn something from every experience you go through. But you learn according to what *you experience* in trying to meet needs that *you feel* and demands that *you see* your environment making on *you*. This is why the same stimulus can induce such different responses in two individuals. What they *experience* is different; hence their responses and their learning vary.

With the emphasis in recent decades on "learning by doing" and "learning by experience," it has sometimes been implied that some learning is *not* the result of experience. But the difference is only in the type of experience—the quality and breadth of it and whether the whole learner is closely involved in it or only his eyes and his memory, figuratively speaking.

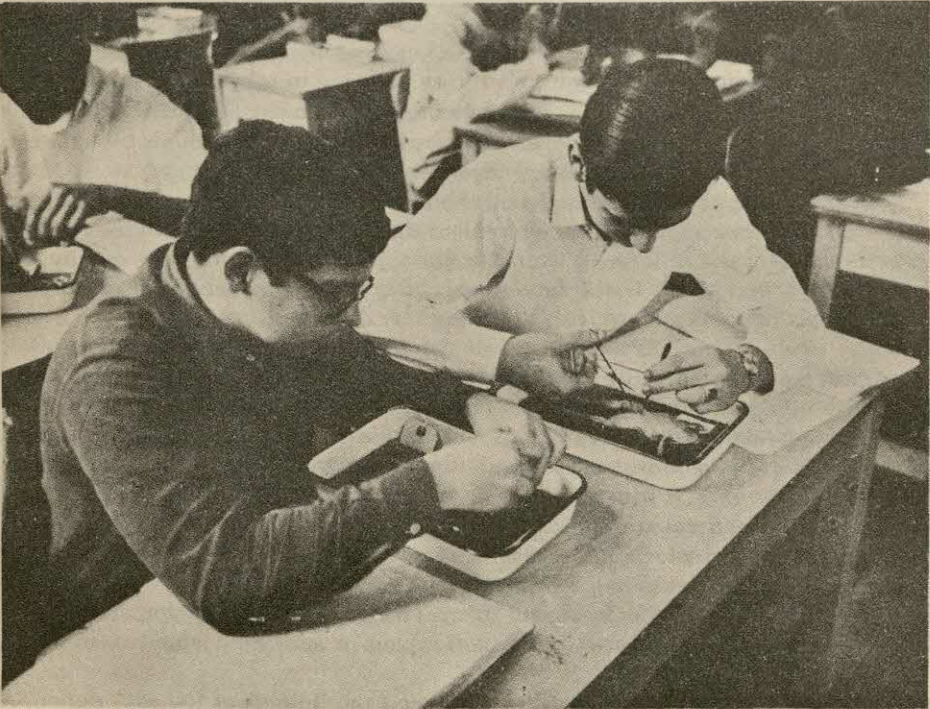
The new emphasis is not on experience versus lack of experience but rather on richer, more varied, more appropriate experience. You can learn to say a list of words by sitting and looking at it, but you can learn healthy emotional expression only through experience in situations that evoke emotional responses. You can learn by rote to parrot abstract ideas, but you can make them a real part of your intellectual life only if you understand them well enough to use them in novel situations where they are relevant. You can learn self-control only by experiencing situations in which self-control is needed and proves effective. You learn sympathy and understanding for people of another land best by seeing, feeling, and imagining what life looks like to them. This you can do by going and looking or by listening, seeing pictures, reading, thinking, or acting out situations in which you take their role.

Learning cannot be expected to transcend the bounds of the experience. A barren, narrow experience will lead to barren, narrow learning. If the experience

is only dealing with words, the learning will be only verbal. If an experience calls forth thought, imagination, emotion, memory of past experiences, and appropriate physical activity, it is a richer experience than one in which all the learner has to do is memorize the five reasons the book gives for the decline of the Roman Empire. As such, it involves the learner more fully and can lead to broader, deeper learnings. The potential is there.

This point has been well summarized by Anderson and Gates:

... the only control we have over product is through experience. The teacher can never impose the product directly. It is the pupil, not the teacher, who is the active learner. The major control which the teacher has, then, is in trying to make sure that the pupils have certain experiences and also in trying to make sure that they do not have certain others. This point is obvious in certain areas. A child can only learn to play the piano or type as he has experience in playing the piano or in typing. Many teachers (and parents) have, however, not been able to understand the equally valid statement that children learn to make decisions only as they face situations in which they must make decisions, that they achieve control over their emotions or learn how to work co-operatively with others as they have other experiences in which emotional control or co-operative work skills are relevant. (1950, p. 30)



While the principle of "learning by doing" is important in any field, it is indispensable in scientific areas. The best way to learn how a frog (or any animal) is put together is by taking one apart.

Learning is purposeful

Through his various senses, the learner apprehends any classroom situation as calling for certain action from him. Different children may see the same situation as requiring quite different actions on their part because of their differing interests, past experiences, and self-pictures. The same event may be seen by one as threatening, by another as an opportunity to display his proficiency or improve his status, by a third as "more of the same boring stuff." If the situation is a teacher request to write down the capitals of all the states, one child may see the required action as speedy acquiescence to please the teacher. Another may see the situation as one in which he obviously must sneak enough looks at others' work to get a passing grade and avoid a beating at home. Still another may see this as a natural occasion for disrupting the class activities or trying to impress Suzie across the aisle. Each will then act in accordance with the requirements *he* sees in the situation; he will learn what behavior is successful in fulfilling these requirements and what is not. Other things going on will be peripheral in his perception, and as such will induce only incidental, peripheral learning. One advantage of a teaching machine—and an important one—is that for the moment at least, its requirements are likely to be central in the learner's experience.

Any child's learning, in or out of school, is closely tied up with his purposes, goals, and past satisfactions and dissatisfactions. Take nine-year-old Joe, for example (page 109). Joe gets intense enjoyment from physical activity, from contact with age-mates, from satisfying his curiosity, from proving his masculinity. Some of these are satisfactions because of Joe's own unique past; some are satisfactions for most boys his age.

Joe, at school, would learn from any activity that would yield these satisfactions, whether teacher-inspired or not. He would seek contact with the other boys—openly if encouraged by the working plan of the class, covertly if not. His own personal needs and his perception of his role in the group would shape what he learned quite as much as what the teacher might be trying to "get across" to him.

The importance of the learner's purpose in the act of learning cannot be overestimated. To be sure, sometimes learning occurs more or less fortuitously and such learning may sometimes have considerable impact on an individual. In the case of formal learning situations such as the school, however, the learner's own conscious purpose is decisive.

One of the important things a skilled teacher does is to relate the new learning to the pupils' own goals—in the process helping them to expand their aspirations. Hard work is often involved in new learning tasks, but when pupils are eager to realize the results their efforts will bring, they will work willingly. Both the hard work *and* the results are satisfying to them, giving them a sense of accomplishment and growing power. It is indeed difficult to find evidence for the still widespread belief that the more bitter the medicine, the better it is for the patient.

TEACHING FOR CLARITY

In many situations, to perceive is to learn. Once you "see," you know. When this is true, it means that the pattern in the stimulus field is obvious without teaching and

without search on your part. This matter of "seeing" is very deceptive. When it is an uncomplicated situation such as seeing the color of the deposit left on a glass plate by smoke, or seeing that water can turn the mill wheel, very little need be added to the sensory data. However, to "see" from a diagram how an internal combustion engine works is quite another matter. Each is dependent to a degree upon previous experience of the learner, but not to the same degree.

Evidently we do not perceive everything in the stimulus field equally and not all stimulus fields are easy to "see at a glance." In much of our everyday experience the important relationships are not obvious. They may be ambiguous, or the important essentials may fail to stand out, as in camouflage.

So that you can see at first hand how perceptions may be fuzzy or inaccurate or missed altogether, a task has been set up on page 218. You should complete it before reading further.

As you could see from this task, the pattern which the teacher hopes will be the perception may not be seen at all. A class once went to a gristmill to see how grain was ground, but the impressive part of the whole trip to the children was the miller's three-legged cat. The cat was seen while the stones ground their way only on the periphery of the pupils' perceptual field.

In any perception certain parts of the stimulus field stand out as "figure," and certain parts remain "ground." Early experiments by Rubin (1915, 1921) showed that whatever is seen as figure has definite form and seems to be in front of the ground which, in turn, is not only without form but seems to extend behind the figure. Even more important for a teacher, these experiments showed clearly that it is the figure the perceiver pays attention to, remembers, and later recognizes, not the total stimulus combination.

The figure the perceiver experiences depends both on what is there and on factors within himself. For the teacher, this means helping in two specific ways: (1) patterning the external field as clearly as possible so that the important things will stand out, and (2) guiding the learner's perceiving. This latter is what we did in the questions accompanying the two ambiguous figures.

Structuring the stimulus field

Often in a lecture or a textbook assignment students complain that they are unable to tell what is important and what is not. They complain that they do not know what to concentrate on when they are studying for a test. Everything they have listened to or read is "ground." There are no "figures."

Sometimes an inappropriate figure is emphasized. Think of the ideas most children get of George Washington. These are likely to consist of scattered impressions about cherry trees and white wigs with little real emphasis on Washington the man. In one classroom, the emphasis on Washington's wooden false teeth became the figure while the other considerations fell into the background.

What makes the desired aspect stand out in the perceptual field? How can a teacher arrange it so that the figure he wants seen will be the one students see?

1. He can point out and emphasize the crucial factors. Teachers may do this

in many ways, by gestures or verbal signals, encouraging pupils to concentrate on certain designated aspects of the total situation.

However, unless there is support from the arrangement of the material itself, words alone will not be enough. The presentation must have differential emphasis. The ideas that become predominant in the learner's mind are those that he sees as contrasted in one way or another with the background.

In textbooks, this contrast may be achieved by various visual devices: italics or underlining, headings, larger or bolder type for main points, spatial arrangement, or presentation in a graph. The points in an argument will stand out better if they are numbered and put in a list than if they all run together in a paragraph. Emotional elements, too, may provide dramatic emphasis.

2. The teacher can present inclusive wholes, units that provide an overall integration. An overall pattern seen at the beginning gives learners a framework. They need this before they can identify segments, see relationships, and fit them all into an integrated pattern.

Material supplementary to the basic perception toward which the teacher is striving can tend to break down the pattern. Where the reading of a poem in a literature class is broken by continuous excursions into syntax, grammatical incidentals, or word derivations, understanding at the end may be sketchy. After the general pattern is perceived, supplementary elements are important, but if they are brought in as interruptions to the understanding of meaning, neither the main subject nor the additional material is adequately grasped.

3. In all but the most simple experiences there is need to point out the pattern explicitly. Did you see all the patterns in the figures on page 218 without help or did you need the questions or perhaps even the altered versions in order to see them?

Many times a teacher will find on investigation that the basic factor was missed, even though he took great care in pointing it out. Or he may find that although the students have grasped the major point, they have stopped far short of seeing how the parts relate to the whole. He needs to take care to point out the structure of relationships between subpoints and central idea and not be content with simply a general perception. The pattern may need to be developed quite explicitly. Much that is perceived by some pupils or seems obvious to the teacher may be masked and lost to others, like the "Christ in the Snow."

Guiding the perceiver

In the Stanford-Binet intelligence test a picture shows a man walking in the rain but not using his umbrella for protection although he has it up. The child is to say what is odd about the picture—a matter of perception. An average five- or six-year-old child might be able to describe the picture properly, but would not see what is strange about it, while the average seven-year-old would.

There are both age-level limitations and individual differences in ability and experience which teachers must recognize. The following suggestions may help you to accept and use these individual differences:

1. As a teacher, you can help perception by creating desirable sets or predispositions to the material before exposing the learner. Leeper (1935) carried out an

interesting experiment with the old woman-young girl picture. First he made the two redrawings that you saw, one showing only the old woman, the other only the young one.

Presented with the picture you saw first, about two thirds of his subjects saw the young woman and one third, the old one. But when Leeper showed the old woman redrawing first, and then showed the composite, all but 3 per cent saw the old woman in it. Another group, given a preview of the girl redrawing, all saw her in the composite.

There are two interesting things to observe here. First, the two possible perceptions apparently are not equally evident: one originally had twice the potency of the other. Second, it is frequently possible to obtain the desired perception by preparation ahead of time. This in effect is what the teacher does before a field trip or a film when he suggests that the class watch for particular things.

2. A teacher can work directly to help students learn to observe carefully. Even at the prereading level, children can look at a picture of several toys on shelves, and then when the picture is removed, try to remember what was there and which ones were on which shelves. With practice in looking at such pictures for the purpose of remembering, they become much more careful observers. Looking for ways to classify items—"playthings," "animals," "food"—helps them too. Guidance in looking for relationships, in comparing and contrasting, and in searching their memories for comparable past experiences all help children to form the habit of looking more carefully and hence seeing more clearly.

3. Past experiences and present knowledge may either help or hinder pupils in seeing the desired relationship or element in a new situation. A teacher may need to break down old ways of seeing before he can establish new ones. At the same time he can be careful to build perceptions today that will help rather than hinder tomorrow's perceptions.

Jamming, on a radio broadcast, camouflages the important figure and prevents it from being heard. Preconceived ideas or habits of feeling about a racial minority or about one's parents or one's ability to learn arithmetic can have the same inhibiting effect on accurate perception. On the other hand, previous experience may help you to structure a new situation. For example, experience in remodeling old houses may help you see at a glance the important elements and relationships in any house. Students inevitably bring biases and prejudices to any learning situation as a result of their past experiences and personality make-up. Their attitudes, feelings, needs, and prejudices all have much to do with what they perceive and how they perceive.

Recent research has given us many demonstrations of this phenomenon. In testing people's ability to see words which are presented for recognition by a tachistoscope,¹ many studies have shown that the words missed or seen as something other than the right words are most often the words having a significant emotional meaning for the subject. These words are often ignored or altered to more comfortable ones.

To a significant degree we all see what we want to see. This is as true of a teacher observing the gang on the playground as of a person with strong feelings

¹A machine which presents a stimulus object for a fraction of a second.

about a political issue. The new material that we unconsciously select and learn depends on what fits in with our past experience and our present convictions and needs.

In a study conducted during World War II, a "biography" was printed but three different names were used on separate forms: Hitler, a prominent Democrat, and a Republican leader. Various subgroups and controls were used in the experiment. Each subject read one form of the biography and then was tested on what he remembered. The subgroup of students with favorable Republican attitudes tended to ascribe favorable motives to their candidate. Likewise, the subgroup with favorable attitudes toward the Democrat ascribed good motives to *him*. But students with unfavorable attitudes toward these men gave them negative motives despite the fact that all had read the same material. It was found that the more advanced a pupil was in school, the more his attitudes seemed to influence his perceptions. Likewise the more ambiguous the material presented, the greater was the distortion in interpretation (McCaul, 1944).

Perceptions can often be sharpened by a comparison of differing points of view. The teacher who encourages students to observe and compare contradictory ideas is helping them to achieve more accurate perceptions.

4. What is not perceived will not be learned. Because a relationship seems obvious to the teacher, he may point it out and go on to the next point assuming that his hearers are still with him. But if point two depends on point one, the learner will be lost if he has not understood point one. No matter how obvious a point seems to the teacher, he needs to check to be sure each link in the chain has been fully grasped before he can be sure that the next one will have meaning. If the first one is not understood or accepted, he will need to go back and build readiness.

Without close communication at the start and at each step, the teacher may not realize that he is failing to make contact. He may even interpret poor test results at the end as the result of "poor application"—the student's fault—failing to realize that he himself did not keep checking on understanding.

A. W. Combs says: "The personal field of the individual is always organized and meaningful and, even with exposure to events, only those aspects that have meaning for the individual in his own unique economy will be differentiated with permanence." (1952, p. 665) Unless the student's perception is expressed to the teacher, it will be impossible for the teacher to know what the individual student has seen and hence what he is learning.

In your task on page 218 the book was the teacher. The questions were put there to guide your perceptions. Perhaps you saw all the figures at once, without help, or perhaps you saw them after viewing the separated pictures, or maybe you never did see them at all. A teacher who keeps in touch with what students are experiencing can be more flexible than a printed page, cutting out unnecessary explanations, spending more time on points causing trouble.

When a teacher concentrates on what he expects the child to do—reading, making an outline, answering questions, and so on—the child may go through the motions without ever seeing the important elements. You wonder how much good the after-school sessions scheduled by Miss Blake (p. 30) will do her pupils if they mean just more of the same *activity* with no more attention to the children's *perceptions*. If what is "figure" to the teacher is never seen by the child, he can

add it to his repertoire only by blind trial and error, if at all. He can learn only what he sees.

5. If a child feels anxious or insecure, he is not free to perceive clearly and objectively. Lighthall (1964) has summarized the debilitating effects of anxiety on thinking and learning. Jill, the economically favored but psychologically deprived child in Chapter 4, is an instructive example of how anxiety affects school achievement.

In a study of high-school students, Sarason (1963) found a negative relation between anxiety level and achievement; a study by Lunnebourg (1964) tended to confirm Sarason's findings. However, certain qualifications are necessary in interpreting these results. For one thing, anxiety level was more significant in influencing the achievement of girls than that of boys. For another, the results varied when different anxiety scales were used. It was also found that test anxiety, which is a much more specific form of anxiety, had more influence on performance than did general level of anxiety.

There is also evidence that students with varying levels of general anxiety perform differently depending on the nature of the educational setting. Grimes and Allinsmith (1961) found that highly anxious children did much better in a school situation which was highly structured than they did in a situation that was relatively unstructured. Those pupils who were highly anxious and highly compulsive did extremely well in the rigid school situation. More investigation of these matters is needed before any firm conclusions for practice may be drawn. In the meantime, it is likely that the teacher will do best if he tries to make students feel at ease and adequate to do what is expected of them, and he must recognize that this will mean different things for different personality types.

A child feels threatened by an adult who seems to dislike him, by a situation in which he cannot figure out what his role should be, or by demands on him that he feels inadequate to meet. Such feelings of threat will tend to limit and "freeze" his perceptions and keep him from understanding as well as his ability should make possible. For the teacher, this fact points up the importance of a friendly atmosphere, clear and consistent rules, and demands tailored to fit children's readiness.

In guiding the perceiver, then, you will be trying to do all in your power to make the desired figure stand out. You will help him make differentiations, see relationships, and organize what he is learning. You will help him feel free to explore what he sees, and you will try to create a climate in which clear perceptions are valued.

MAKING LEARNING MEANINGFUL

If learning is to broaden the individual's potential for more effective behavior outside the schoolroom, the learner must see the relation of the current learning to his life and must be able to recognize situations where the new understanding or skill is appropriate. This means that, insofar as possible, what he learns must be meaningful to him.

Learning without meaning is blind, rote learning. It is the inflexible, rigid, literal acquisition of information, attitudes, and set ways of acting. Rote learning

does not require the "higher mental processes"—reasoning, analyzing, imagining, integrating ideas, evaluating, and so on. It does not go beyond simple retention of material presented—retention exactly as perceived.

By writing "I have gone" one hundred times, the boy memorized it *as a school response*. But he saw no connection between "I have went" and "I have gone." The phrase he copied meticulously over and over was just so many words to him, words that had no real meaning. He was unable to put them to use when the appropriate occasion arose.

If you can cook only by following a recipe, you are stumped when you find you are out of one of the ingredients. Unless you know what each ingredient does, you cannot know whether the missing one is essential or whether you can substitute something else.

A kindergartner who has learned to get to school by going "down the street to Susan's house and then through the alley to school" may not realize that he could also get there by going over a block sooner and may be completely bewildered if the alley is cut off one morning.

Thus rote learning is segmental learning. One cue brings forth a specific response. And the response is given only to that cue or one seen as equivalent. But life is full of complex situations, no two just alike. The more flexible your responses and the broader your understanding of "how's" and "why's," the better you can analyze the new situations you keep meeting and adapt your responses to suit each new need.

Rote learning is less efficient than meaningful learning in other ways, too. It is less interesting, less satisfying; learners tend to resist it. It does not involve the whole learner and is less apt to serve his conscious goals. And rote learning, without overlearning and a great deal of use, is quickly lost. Whatever meaning the learner can be helped to see, either in the task itself or in its part in his life, will help him learn and remember.

These considerations give us clues to understanding the nature of meaning and the character of meaningful learning. We can summarize by stating three generalizations:

1. *Meaning involves relationships among ideas, things, and events.* An idea, for example, has meaning for an individual when he can anticipate certain consequences that will occur when he applies the idea to some situation. Take the term *oxidation*. If a student is aware, through experiment or observation, that iron will combine with oxygen to produce a compound, iron oxide, and if he is also aware that when oxygen is prevented from contact with iron, no oxide is formed, then the term *oxidation* has meaning for him. He knows that certain relationships exist between two chemical elements so that when certain operations are performed, certain results will occur.

We can think of relationships as being of two kinds. There are *formal relationships*, which are elements of a logical system such as mathematics. Their meaning derives from membership in the system. Thus, $2 + 2 = 4$ is a meaningful proposition in arithmetic because it is part of the deductive system of mathematics. Its meaning comes from the whole system of arithmetic relationships. The equation $2 + 2 = 4$ is meaningful to you because you have enough grasp of arithmetic to relate this equation to many other elements of the system.

On the other hand, it is not likely that the formula $[AvB] \supset [BvA]$ has mean-

ing for very many who use this book. Unless you have studied symbolic logic and know at least something about the symbols and relationships of this system, the formula, to you, is only a few rather mysterious-looking characters whose meaning is nil.

The other kind of relationship is *inherent in nature*—that is, the type of relationship which must be discovered through experience. Given the definitions, assumptions, and theorems of arithmetic, the equation $2 + 2 = 4$ can be known to follow necessarily and can be discovered only by logical deduction. But it is not possible to prove by deduction that iron and oxygen will combine to form an oxide. At some time somebody had to establish this by experiment and observation. It seems reasonable to suppose that if *iron* and oxygen combine to form an oxide, then *lead* and oxygen would behave in the same general way. But nobody knew for sure whether this would be true until a parallel experiment was performed and the results noted. Relationships of this sort must be established experimentally.

We can say, therefore, that meaning derives from relationships among things and events, whether these are formal logical relations or the phenomena of nature or society. The more of these relations you are aware of, the more meaning you see in a situation.

2. *Meaning builds on past associations.* Sometimes we encounter situations for which our background of experience is simply insufficient. In such cases we cannot deal intelligently with the situation because we do not *understand* it—perceive the important relationships. We are forced to primitive levels of behavior.

For example, without some background in symbolic logic, $[A \vee B] \supset [B \vee A]$ has no meaning for you, no matter how intelligent you are. Without background, all you can do is guess randomly about what the formula signifies, and in this case such guesses are likely to be wide of the mark. You could, of course, learn to reproduce the symbols or try to apply what you know about algebraic relationships. But you have no way of knowing whether they are relevant, and in any case they do not carry you very far.

For the teacher, the important thing is to introduce new material only when students have the necessary background to understand the relationships within it and so relate it to what they already know.² When a student is unable to perceive relationships among new ideas and between the new material and ideas he already has, the new learning can be little else than rote.

Often out-of-school experience can be helpful in understanding or appreciating a new concept *if* the student sees the connection. But such a perception can never be taken for granted, however obvious it may seem to the teacher. Providing continuity of experience is a problem with children from any kind of background but in the case of culturally deprived children it often becomes crucial. Deutsch (1965) observes:

Just as the learning context changes when the child enters school, so does the psychological context for achievement. Here is where the amount of continuity between the home environment and that of school can be very influential in establishing the child's response to the learning

²The kind of continuity that is essential to learning is discussed in the Reading at the end of this chapter.

context and the achievement context of the school situation. The discontinuity between the lower-class child's background and the school is detrimental to his successful response to the new situation. (p. 321)

Jerome, whom we met in Chapter 4, provides an example of the unfavorable effects of discontinuity.

Building on out-of-school experience is especially necessary at the primary level, for primary-age children have had little previous school experience to draw upon but have had extensive experience in home and community backgrounds. A skillful teacher can often use this experience as a bridge to new concepts. Authors of reading texts typically plan the content of their primary books around incidents that will be familiar to young children.

3. *Meaning derives from relationship to the perceiver.* Some people think that meaning is an inherent quality of things in the same sense that such qualities as color, size, and shape are inherent. They assume that a desk has inherent meaning in much the same way that it has a brown color, a rectangular shape, a smooth surface texture and so on. Similarly, they assume that $2 + 2 = 4$ or $[AvB] \supset [BvA]$ also has meaning as an inherent property and that the meaning can be apprehended in some way by the "mind."

Careful thought casts doubt on these assumptions. A desk is an object that can enter into various kinds of relationships. In our relation with it we will *respond* meaningfully or without meaning, depending on our previous experiences with objects of this kind and the relationships we are able to perceive. A desk may have all manner of potential relations, all of which are facets of meaning in this sense. It may "mean" a place to write, a place to put one's feet while loafing, cabinet work by Chippendale, or what little brother fell off when he broke his arm.

These relationships or associations or "meanings" are numerous or scant depending on our previous experience. The important matter is that our reactions to this object may be fraught with meaning, may have little meaning, or may have none at all. In any event, whatever meaning there may be is in *the perceiver*, not in the stimulus object, in this case the desk.

Meaningful behavior, then, occurs when you are aware of relationships—especially cause-effect relationships—among things and events or between them and you. When this awareness is present, you can predict and control events. Your behavior is flexible and adaptable—in other words, intelligent.

The rest of the discussion in this section will be meaningful to you to the extent that you can relate it to your own experience of making different kinds of associations under different circumstances. For such experience, turn now to page 219 and follow the directions there for performing Tasks 2 and 3.

The lists in Task 2 differed in degree of meaningfulness but were alike in being material presented for you to memorize. Verbal learning tasks in the psychological laboratory, as already indicated, have usually been like those in Task 2. Specific material has been set out to be learned verbatim. This has been essential because the "response," like the other factors in the laboratory situation, has had to be carefully defined ahead of time in order to be measured and compared from one task to another or one learner to another.

School learning has sometimes been of this type, too. Dates, definitions, rules, "multiplication tables," and so on have often been set before the learners to be learned verbatim. To the extent that teaching machines, or other devices for using "programed" material encourage the verbatim learning of specific "right answers," their usefulness will be limited.

The Esperanto symbols also were items presented for you to memorize. In this case there was an added factor: the new symbol had to be both *retained* and *associated* with a word or phrase you already knew.³ But in both cases you learned *verbatim material* that was set before you and you did it by the method of *drill*.

In Task 3, with the pictures, you had items to commit to memory, but you tried two methods of learning them. With the first group (unless you happened to notice the natural groupings) you probably just tried to fix the items in your mind like the list of meaningful words so that you could call them up on demand. But with the second group, by looking for relationships, you undoubtedly learned more quickly and remembered all the items. Incidentally, this is a good illustration of the difference between learning with and without a teacher and also of the first point under *Guiding the perceiver* (p. 202)—the advantage to perception in being primed ahead of time on what to look for.

Tasks 2 and 3 required verbatim learning. But most learning about relationships does not take place through memorizing of material put in front of you. Suppose, for example, that on a train trip west through mountains, you notice that every so often the train goes through metal arches which seem to have fringe hanging down from them. Looking closer you see that this fringe is apparently a row of pieces of rope hanging down so that they almost touch the train cars going under them. You wonder what they are for. You can see no pattern in the number of pieces or their lengths. There seem to be no electrical connections. They are not near towns. Nor are they spaced at equal intervals.

Finally you notice they are not far from tunnel entrances and exits and it suddenly dawns on you that a man on top of a freight car, unaware of an approaching tunnel, would be warned of it by those dangling ropes and would have just about time to lie down flat. On inquiry you find this is their purpose, although they are a relic of former days and are not needed by modern trainmen. They are called "tell-tails" and were needed when men had to go along the top of the train from car to car setting the hand brakes.

Such a problem calls for even more active searching for relationships. And during the searching, the ultimate answer—the thing to be finally learned—is not even in the picture. Here, remembering the correct answer is the easiest and shortest part of your activity: once you meet it, you know it, and a week from now you will still know it whereas you probably will have forgotten the sentence about Jefferson.

When the greatest part of your effort is devoted to actively seeking relationships rather than trying to commit to memory someone else's answers, you are

³Associationism of some type or other has been discussed as a way of learning at least as far back as Aristotle. Since that time there have been many variations of the basic theory that learning takes place by building new associations. To some, the mind itself is an aggregate of the sum total of these associations. Behaviorists, notably Thorndike, Watson, and Guthrie, have felt that all learning can be accounted for by this concept. For a contrary view, see D. O. Hebb, "The American Revolution," (*American Psychologist*, 1960, 15, 735–745).

likely to find that what you learn is much more easily remembered. Thus, setting out material for children to learn verbatim in the classroom is a relatively inefficient way of getting them to learn. Furthermore, it assumes (1) that children learn what they are told to learn and (2) that teacher planning for sequence and continuity automatically ensures sequence and continuity in learning. Both these assumptions are now known to be fallacious. A child learns from his experiences whatever he sees as best satisfying his purposes and needs. Only as school learning activities are geared to his needs and interests and readiness will his learning be continuous and sequential in the direction the teacher wishes, and only then will what is learned be remembered and used.

Ensuring relationships in the material

In your life you have to learn many relationships in order to cope with the world of reality and communicate with other people. Sometimes these are logical relationships or relationships inherent in nature, as we have already noted, but at other times they are purely arbitrary.

You call one object a table and another a tree although you could just as well have learned to call them a "famer" and a "sibo." Other names or labels would have been equally appropriate, but these are the ones this society has adopted.

Unfortunately, even relationships that have inherent meaning—such as the relationship between iron and oxidation, between gravity and a falling object, or between electric current and a closed circuit—are sometimes taught as arbitrary associations and the students never see the meaning. The learning is then surface learning. If the meaning is not grasped, the association cannot be put to work.

As you have seen, a relationship can have meaning for you either if you see it as inherent or logical or if you see it as related to you in some way, perhaps as something potentially useful or dangerous or enjoyable. Even arbitrary relationships can acquire this latter kind of meaning through your experience with them. Thus, there is no inherent relationship between an eight-sided sign and a foot on the brake; yet if you drive a car, stop signs have become loaded with meaning for you.

Perhaps one experience with slamming on your brakes at an icy intersection will be enough for you to learn the relationship between braking and skidding on slippery pavement. But other associations are not so quickly learned. This is especially true of arbitrary associations such as word symbols. If you were learning Spanish and were required to call a certain object *mesa* instead of table, you would need to have many meetings with the word *mesa* and many chances to use the word before it would become automatic. Eventually, however, you would immediately perceive *mesa* as designating that object and be able to use it automatically.

The range of situations in which you would make this automatic response, however, would depend on the range of situations in which you met the word or needed to use it during your learning. Drilling on vocabulary lists would not be nearly as efficient as encountering the word repeatedly in different contexts in your reading, hearing, speaking, and writing. For automatic understanding and

use of the word in context, you would need to learn it through seeing its meaning in different contexts.

The effective teacher, wherever possible, sets the stage so that the "facts" his students encounter fill a recognized need or help solve a problem or fill in a gap. In this way they are highly meaningful. And because they have meaning and are useful to the learner, they are more likely to change his ways of thinking, seeing, feeling, and doing.

When you did Tasks 2 and 3, you saw that meaningful material is much easier to learn than material which has no meaning. You also saw that patterns in the material make a difference. Lists B, C, and D were all meaningful words, but C was easier to learn than B because all the words were related. List D was easiest of all because the relationship between the words was closest. Even in the nonsense words, you probably found yourself trying to form associations or make groupings that would help you remember. The items that lent themselves to such handling were easiest for you to learn.

Seeking patterns for learning is not unique with you. It has been found that students in general do a great variety of things to reduce rote memorization. It might better be said they try to convert rote aspects into meaningful material. There is real, active, and justified resistance to meaningless memorization. In learning tables of numbers, for example, children often attempt to form the figures into rhythmical patterns, searching for similarities in an effort to make sense out of the apparent hodgepodge.

Teachers can learn from this effort by providing specific meaning and pattern wherever possible. Thus, things which are in general alike and yet have their differences—two verbs, for example—may be taught together with the exceptions pointed out along the way.

Children today begin to learn to read not by drilling on certain words or combinations of letters but by meeting certain words over and over again in meaningful situations until they have a basic sight vocabulary that they know thoroughly. Not only are these sight words recognized instantly, but they have become steeped in associations and imagery until they are truly part of the learner, firmly anchored to his past learnings. Then, working from these familiar, "automatic" words, the child can begin to examine beginning letters, relate them to certain sounds and start to learn ways to unlock new words.

Ensuring relationship to the learner

As you have seen, only part of the meaning to be found in associations lies in the material itself. The other part lies in the relationship of the associations to the learner. Part of making new ideas or material as clear and meaningful as possible is helping the learner examine what they may mean to him, how they check with other things he has learned, how they can be useful or threatening or perhaps satisfying to him.

If you were to compare notes with your classmates on the associations you used to help you remember the nonsense words in the task on page 219, you would find considerable variety. This reflects one of the most important characteristics of associations. Like all products of learning, they are highly personal,

built from the experiences of each individual into his own pattern. No two people form quite the same associations because no two people have had quite the same experiences.

Teachers often try to make learning more meaningful by helping students create associations between the new material and old and familiar material. A teacher of Russian, for example, suggests that you remember the Russian word *potolók* by associating it with our term "potluck." Or a music teacher points out that the spaces in the treble staff spell "face," and that the lines can be remembered by the sentence "Every good boy does fine." But whatever help is given in the forming of associations must be realistic for the one doing the learning. Undoubtedly you have had teachers or friends who tried to help you remember something by giving you highly personalized cues to provide a pattern. Sometimes you may have remembered the cues but not what they were supposed to remind you of. Patterns that mean something only to the instructor are of no use.

Even the same word always means something more or less different for each individual. The word *house* to some people may have connotations of home and family, to others may mean only a structure. There is also the problem of *house* in different locations and for different species: the igloo, the hut, the house for birds, the rabbit's house, and so on. And to complicate the problem further, many words have several meanings, so that no single association is sufficient. The word *run*, for example, has over fifty meanings in one dictionary.

Suppose you come across the word *Anglophile*, which you have never seen before. If you are familiar with the elements of the word (*Anglo*-English; *phile*-love), you will probably be able to work out the meaning for yourself. If you are not, you will have to look it up in a dictionary, where you will find it defined in terms with which you are familiar. Either way, the word will have no meaning for you until you can relate it to something you already know. In the same way, new symbols or associations between symbols are meaningful to a child only as they are related to his experience.

So when the teacher wants children to learn new responses and eventually to see them as equivalent to old ones, as in learning to read or learning a new language, he has to know what responses are there to build on. A child cannot learn to recognize the printed form for a word unless he has already identified the sound and meaning of that word and distinguished it from similar words. For example, if in his speech he has assumed that *then* and *than* were the same word, he will have to differentiate between the two words before he will be able to learn the correct printed symbols for them. If he says "hunnert" for *hundred*, he will probably have trouble learning to spell *hundred* correctly. Nor will a child understand a teacher's talk about "brotherly love" between peoples if his experiences with a brother have been full of resentment and competition.

In working Task 2 on pages 219-221 you saw that associations could be completely arbitrary (the nonsense syllables), slightly meaningful (actual words which you knew but which were unrelated to each other), or highly meaningful (words related to each other, words that form a logical sentence, Esperanto symbols for English words you know). Try to recall right now the list of nonsense syllables you learned. Now try to translate these phrases into Esperanto: *Come in. It is I. Very well, thank you.*

Can you still remember the two types of material equally well? Were the

nonsense syllables you recalled the ones you had associated with things you knew? When you learned the two lists in the first place, which did you find more difficult? Which was more interesting to learn? How does your memory of the pictures you saw compare now with your memory of the words? What generalizations about retention of learned material can you draw?

When a learner can get an overview and see where parts fit in, the parts become more clearly differentiated from each other. Each is then seen as having a unique role and is easier to learn because it does not become confused with the other parts. Thus, a good starting point for the study of the basic structure of American federal government is a consideration of the fact that government involves three different but complementary functions: the executive, the legislative, and the judicial. This helps the student understand why the Constitution provides for three coordinate branches of government.

Then, if he can mull over the situation and look at it in different ways—for example, thinking of instances in which there is a distinction between passage of a law and the interpretation and adjudication of particular cases under that law—he can pattern what he learns and enhance its meaning by relating it to what he already knows from previous experience. Very often this can reduce resistance and ease the burden of learning.⁴

STIMULATING INQUIRY

One of the early and most significant protests against a curriculum based almost exclusively on the teaching of specific facts and generalizations was made by John Dewey (1910). He maintained that true education is not the mere transmission of accumulated material but rather a process of assisting the development of certain natural tendencies of the child. He believed that one very powerful natural tendency was that of inquiry—trying to find out.

As Dewey saw it, the contribution of the school should be to direct the child's original impulsive and unformed native powers into systematic habit patterns. By learning through the pattern of controlled inquiry of the scientific method, for example, children would form the habits and predispositions typical of the scientific attitude. He believed that *learning to search effectively*—including learning to identify a problem, formulate hypotheses, gather data, analyze and evaluate evidence, and draw valid conclusions—was more important than *learning particular information*. It was his belief that the habit of controlled inquiry would be useful in whatever situation a pupil later found himself, whereas given information might lose its relevance in a changed situation. Thus the specific subject matter used in teaching he regarded as not an end in itself but a means of inquiry—as *instrumental* in the more important learning—the skills and habit of search. Although Dewey's ideas about the inquiry process and problem solving have often been praised by educational theorists as a potentially valuable way of learning, they have not played a major role in the methodology of most of our schools. By and large, our curriculums and our teaching methods have continued

⁴The implications of an emphasis on meaning, as compared with an emphasis on mechanics, are explored in "Mechanics vs. Meaning—Testing vs. Teaching" by D. M. Jones (*The Reading Teacher*, 1953, 6, 15–22).

to be organized to transmit information in the form of specific facts, concepts, and generalizations. The activity of the learner has been directed toward "acquiring" or "absorbing," and learning has generally continued to be conceived as a "transmission-absorption" process.

We have already seen the fallacy of this conception. The learner does not *absorb* facts but through his experiences with events and symbols constructs for himself a pattern of ideas and relationships which may be a fairly accurate replication of what was in the book or in the teacher's mind or may be quite different. However, the continued emphasis on the learning of specific facts and generalizations, whether by absorption or by replication, is understandable.

First, there is the weight of tradition. Except for a few nonconformists like Socrates, most teachers have probably conceived their role to be one of passing along the nuggets of wisdom that they themselves have acquired and of trying to train immature minds to reason logically by leading them through logical trains of thought, as in geometry.

Second, it is easier to teach and test for facts than to teach and test for the skills involved in controlled inquiry. It is harder to design test questions calling for *application* or *translation* of a principle than questions calling for *recall* of the principle. But both can be done. To a very large extent the objectives encompassed by a curriculum depend on the resourcefulness and imagination of the teacher and the trouble he is willing to go to.

Finally, most of those who stress "facts" undoubtedly do so from a sincere conviction that sound thinking depends on accurate information and adequate tools and that one cannot expect pupils to learn to think productively without a good stock of concepts, facts, and symbols to manipulate.

Actually, Dewey did not dismiss factual material as unimportant—nor did the followers who really understood his theory. Factual knowledge consists of meanings that have already been established. "Facts" are resources for conducting new inquiries, and in this process they themselves are extended and consolidated. Dewey spoke of education as "the reconstruction of experience." By this he meant that the meaning of "facts" is not fixed and stable. New experience reveals new facets of meanings heretofore unknown to the learner. These new dimensions of meaning cause us to keep reconstructing and repatterning our structure of knowledge. This constant enlarging and reconstructing, according to Dewey, is the purpose of education.

Like the nature-nurture controversy, the product-process debate is largely circular and futile. To speak of conducting inquiry without a stock of previously established meanings is like talking about making shoes without leather. But a supply of leather is not the same as the process of shoemaking, even though it may be an essential component. This point was well understood by the Greeks 2500 years before Dewey was born. Aristotle decried the Sophists, who prided themselves on their ability to teach facts, and accused them of confusing the art of knowledge with its product. It was, he said, as though a shoemaker took on an apprentice, promising to teach him the art of shoemaking, and then simply provided him with a supply of ready-made shoes of various sizes.

It has not been uncommon in the history of education, when a new and only half-understood idea has been advanced, for the pendulum to swing too far—before the degree of truth of the new idea and its relation to other ideas were

worked out. Some proponents of the "progressive" approach began to decry the need for facts on the assumption that learning of facts inevitably implied drill, verbatim memorization, and uncreative absorption of what the teacher set out to be learned—which, in fact, it often did. Their influence for a time was such that in many circles interest in "fact learning" or in "fundamentals" was regarded as reactionary thinking, inconsistent with all-round preparation of children for adjustment to their world and participation in it.

Today we realize that such a position indicates confusion about what "facts" are, what functions they can serve, and the ways they may be learned. Facts as ends in themselves, the chief or only goal of education, were certainly a mistaken emphasis. But facts as tools remain as necessary as ever. Since our society has adopted certain symbols—names—to stand for things and ideas, we need to know what those symbols are and how to use them in order to communicate and work with other people. We need to know what is in our world and how things work and are related to each other in order to live safely and effectively in the world. Knowledge and wisdom are more than facts, but cannot be developed without facts.

At the same time, we have discovered that Dewey's proposed emphasis on problem solving can net not only the benefits he saw for it—proficiency in attacking and solving new and unforeseen problems—but also a good harvest of information, concepts, and generalizations. As we have already seen, the information learned through inquiry may be remembered longer and put to better use than the same facts presented in logical sequence and memorized. But the subject matter need not be incidental to the process of inquiry: it can be as central in the learning experience and as important an objective as the searching. No either-or choice need be made. The current concern for developing creative individuals underlines our need to give pupils *both* an understanding of present realities and the skills they will need for attacking new problems intelligently.⁵

Techniques by which these skills can best be taught are under intensive study today. In the Inquiry Training Project at the University of Illinois, for example, special attention has been given to teaching children to ask more and better questions in trying to discover scientific principles. In one study, fourth- and fifth-graders were shown short films of apparently mysterious phenomena and given the assignment of trying to figure out what was really happening. In one film, for example, a bimetallic knife, held over a flame, bends down. Put in water, it straightens out. Turned over and held over the flame again, it bends upward; placed in water, it becomes straight again. In another film a varnish can with a little water in it is heated with the cover off; when steam begins to come out, it is capped and taken away from the heat. Cold water is then poured on it, and the sides buckle inward.

To find out "why," pupils had to ask questions that the instructor could answer by "yes" or "no." At the beginning of the series, they thought of very few questions and had little idea as to what kind of information they needed, regarded experimentation largely as just "watching what happens," and tended to be satisfied with inadequate solutions ("Just a fact of science"). Following each

⁵For a discussion of the use of problem solving in classroom instruction see: Bryce B. Hudgins, *Problem Solving in the Classroom* (New York: Macmillan, 1966).

session they heard a tape of the questions they had asked and were instructed in using questions (a) to identify objects or events, (b) to narrow the focus of their inquiry, (c) to manipulate the conditions of the experiment and check outcomes, (d) to test hypotheses of cause and effect, and (e) to check validity of conclusions or interpretations. By the end of the series, they were asking almost three times as many questions as at the start and were analyzing what they needed to know, organizing and relating information they got through their questioning, formulating hypotheses to test through further questions, and drawing principles and generalizations. They had learned to direct their questions first toward analyzing the actual episode—objects, properties, events—second toward determining what was relevant, and third toward working out relationships and principles. Perhaps even more important, they were more self-reliant in their search and less dependent on the teacher to point the way, and they had come to realize that experimentation involves careful, planned manipulation of variables under controlled conditions to test a hypothesis formulated in advance (Suchman, 1963).⁶

Jerome S. Bruner (1960b) of Harvard is another psychologist who has developed classroom procedures for teaching through stimulating inquiry and search on the part of the learners instead of through presenting material to be learned. In one case, a fifth-grade class in geography was given simple outline maps showing rivers, lakes, and simple notes about natural resources. The pupils were asked to forecast where the major cities would be found, where the railroads would be located, and where highways would probably be. As Bruner has said, this was presenting geography “not as a set of knowns, but as a set of unknowns.”

The object in this work was not primarily to transmit “facts” about geography. Members of the experimental group were not even permitted to consult books and maps for information. Instead they had to exercise their analytic powers to draw inferences from the data they had. The emphasis was on the process of thinking and analysis.

Apparently—and understandably—the experimental group made some errors in drawing conclusions. But Bruner points out that such errors far from being fatal, may be highly instructive. Given a competent teacher for guidance, it is possible for students to profit by their errors and to enhance their understanding. If the student is not to make the same mistake again, he needs to know wherein his *logic* was faulty, not simply to memorize a different answer. He needs real understanding—not merely a red check on an exercise paper. But he also needs a climate in which it is safe to risk *wrong* hypotheses—where he is not rewarded only for correct answers.⁷

⁶There are serious methodological difficulties involved in designing experimental studies of inquiry and discovery learning. For example, if the experimenter is to have adequate control, the task employed in the experiment must be of limited scope. This often makes it impossible to generalize on the results of the experiment to a degree that would be useful in the classroom. Another serious difficulty lies in providing a control group which is taught in a way that is genuinely different from the inquiry method used in the experimental group. There are also problems of measurement of motivational and transfer effects of learning through inquiry. Two experimental studies of interest are: Bert Y. Kersh, “The Motivating Effect of Learning by Directed Discovery” (*Journal of Educational Psychology*, 1962, 53, 65–71) and M. C. Whitrock, “Effects of Extended Effort in Creative Problem Solving” (*Journal of Educational Psychology*, 1961, 52, 117–122).

⁷A description of this study and an excellent analysis of the functions that a good teacher should perform appear in “The Functions of Teaching” by J. S. Bruner (*Rhode Island College Journal*, 1960, 1, 35–42). For further discussion of problem solving see Chapter 6 in Robert M. Gagne, *The Conditions of Learning* (New York: Holt, Rinehart & Winston, 1965).

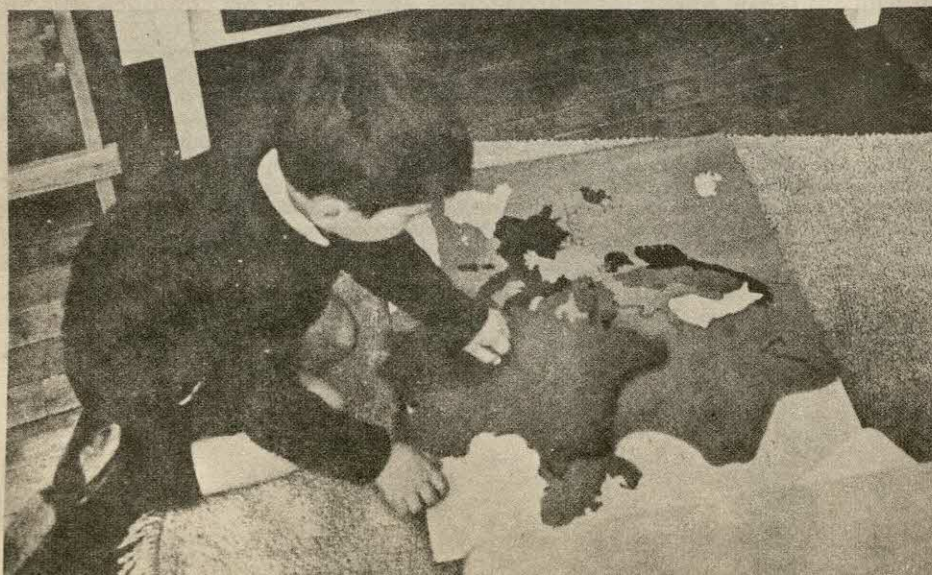
INVOLVING THE LEARNER

If a child learns through what he experiences—what he sees, feels, hears, reads, and thinks—then the depth of his involvement in an event will determine the depth of his experience and hence of his possible learning. By involvement here we mean not just physical involvement but psychological involvement: the extent to which he feels related to whatever it is he is watching or taking part in. Involvement of the learner thus becomes an essential of good teaching.

Physical activity is the beginning of such involvement. It has become an axiom that “we learn only what we do.” For the teacher, this means giving children a *chance to do*—setting up situations in which they *can* engage in the desired behavior. Writing or acting in a play, making posters, giving a demonstration for the class can be the indirect means to involvement with the materials to be learned. Such activities not only involve the student but also give him an opportunity to practice and use the new materials, ideas, skills, and ways that he is learning. For the same reason the chemistry student has his laboratory, the geology student his field trips, the medical student his many hours of internship. And preparation for teaching includes supervised practice teaching in the human laboratory of the classroom. Many college courses combine lecture sessions with smaller group discussion sessions. Student participation, possible in a small group, tends among other things to promote greater involvement, and hence more learning.

Practice in recall during learning is another means of involvement. Through trying to recall, a student organizes what he has learned. He finds out what he has learned and what needs further study. Teaching machines, by continuously calling on students to recall, draw inferences, or establish relationships, keep the learner alert and involved and make it impossible for him to be only a passive spectator. The teacher who can keep students wondering, guessing, anticipating, and intrigued with trying to find answers to puzzling problems is also creating the conditions for active involvement.

But you have also seen that going through the motions is not enough. Witness the boy who said “I have went.” Evidently practice—in the sense of experience in the young child, being involved means being interested. This boy is not ready for involvement in abstract geographic concepts or political principles but is easily involved—and interested—in puzzle pieces that can teach him something about big and little countries and their spatial relationships.



situations in which the response *can* be made—is necessary but not sufficient. To learn best, the learner must do, but he must also want to do and be thinking about the meaning of what he is doing. If the teacher can help students to see meaning in what they are learning and find value in it for themselves and their problems, he has gone a good part of the way toward achieving involvement.

A child's interest is the key to his learning. Capture his interest and he will work with persistence and imagination and learn with phenomenal precision and detail. In school or out of school, a child mobilizes his imagination, knowledge, and skill for any task that is interesting to him. In a situation he finds uninteresting, he will make no such effort. In Chapter 10 you will study further the importance of interest, anticipation of success, and other motivational factors in promoting learning.

One way of inducing involvement is to give pupils a chance to share in the responsibility for their own learning. This seems obvious, yet many a teacher does all the planning, makes all the assignments, and is the sole evaluator—and then wonders why pupils go through the minimum essential motions and seem to feel so little responsibility for their own learning. Even where a prescribed course content must be covered, the teacher can invite pupil help in planning the exact assignments and schedules. If they discuss together at the beginning of a unit what they want to accomplish and why this unit is being undertaken and then at the end review together how well they have accomplished their objectives, pupils are less likely to feel that school activities are an alien experience that someone else is forcing them to undergo. Through really helping to decide just what projects should be given to each topic, they gain a greater feeling of responsibility for the work that follows. And with this involvement and feeling of responsibility, in turn, come both higher motivation to do well and greater satisfaction in achievement. Cooperative planning and evaluation will be discussed further in Chapter 14.

The independent study plans being instituted in many colleges today, by fostering self-propelled learning rather than teacher-propelled learning, also create the conditions for high involvement. There is evidence that such plans do in fact increase motivation, produce greater resourcefulness and independence on the part of students, and result in better retention of material learned (Weitman and Gruber, 1960).

The teacher's own attitudes influence students' involvement more than he sometimes realizes. Is spelling something that one tests every day at 10 A.M., or is it a process through which pupils can learn to make their communication more facile?

Is the civics course interesting and exciting in the eyes of the teacher, or is it an assignment he accepted because there was no opening in American history this term? A textbook can be dealt with as something to be memorized and verbalized, or as an avenue to vital understanding. Films and visitors can be, in the teacher's view, a vacation from teaching or an opportunity for extension of learning. Nor is it only what the teacher *says* about these things that counts: even more it is the feeling the teacher unconsciously imparts by the kind of attention he gives or the attitude he expresses. If the teacher is not involved, the students never will be.

Task 1 DIRECT SENSORY EXPOSURE

Look at the figures on these pages. What do you see? The one on page 219 has two patterns within it. Did you see these right away? Can you see them now? If not, does it help you to know that there are both an old woman and a young one in it?

Can you see any pattern in the figure below? Several years ago a Chinese photographer, troubled by the impact of Christianity upon many of his friends and searching an answer to his own spiritual longing, felt a sudden impulse to snap this picture. When he looked at it later he suddenly saw the face of Christ in it and, feeling it a direct answer to his searching, became a convert.

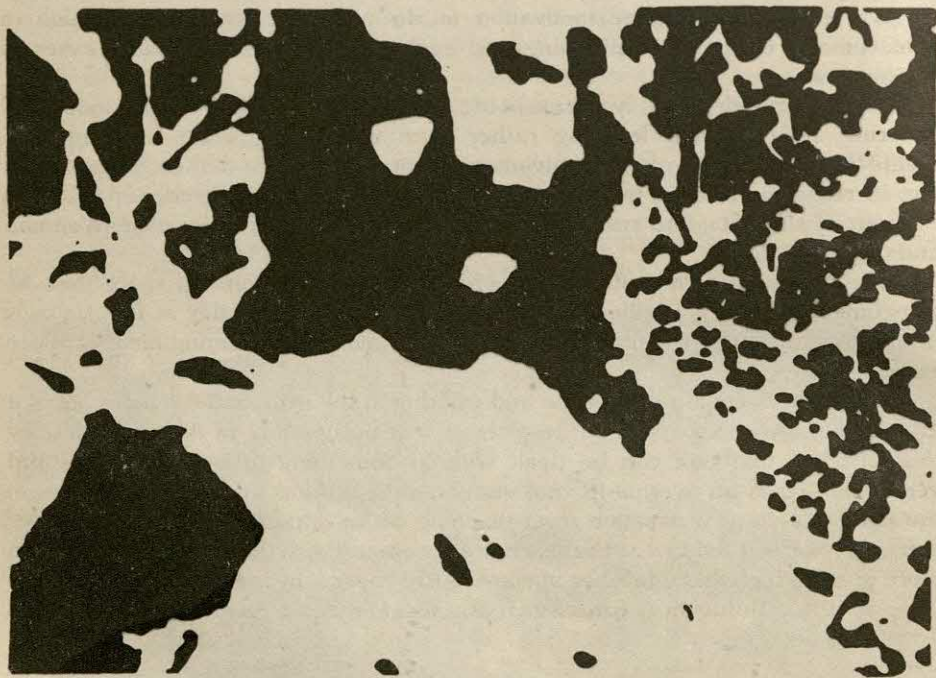
Knowing this about the figure, can you see the pattern now?

If you have trouble seeing either of the patterns, look at the figures on page 598 and then back again at these figures. Does that help?

If you still have trouble, try blocking out the parts that you know are irrelevant to the pattern you want to see.

Some people never see anything but black and white spots in the snow picture, some see a design, and some see highly individualistic patterns—perhaps a dog, a horse, or a profile. Some are sure there is nothing there.

Now turn back to page 200 and continue reading.



Task 2 VERBATIM LEARNING

In this task you are to memorize a list of nonsense syllables, three lists of words, and some sentences in Esperanto.

a) *Word lists.* In the laboratory, lists of words to be learned are put on a *memory drum*. They appear one at a time in a small opening and as each word appears, the subject tries to call out the next one. After the last word is shown there is a short pause for rest, then the first appears again, and so on. This continues until the subject learns to anticipate each one correctly. The experimenter, meanwhile, keeps track of the number of "trials" – the number of times the list is shown.

Try to duplicate these conditions as closely as possible in your learning of these lists. With two pieces of paper you can expose just one word at a time. Look at each one about 2 seconds before moving on to the next. Make a check mark on one of the pieces of paper at the end of each trial to keep track of how many trials you are taking.

Now learn list A, then turn the page.

*list A*

zeb

mij

kaf

tig

lev

dup

han

jex

nol

wuk

gis

yod

no. of trials _____

Task 2, continued.

Did you find some items easier to learn than others?

Did you associate any of the items with words or objects?

Did you try to establish any sort of pattern of rhythm or associations to help you learn the list?

Did you think learning would have been easier if you could have had the whole list before you to study instead of seeing only one item at a time? If so, why?

Now learn lists B, C, and D below, using the same method of exposing one item at a time and keeping track of the number of trials you need.

Wait a minute or so after you have learned one list before starting to learn the next. When you are through, follow the directions on the next page for learning the Esperanto sentences.

<i>list B</i>	<i>list C</i>	<i>list D</i>
sky	book	Jefferson
pen	cover	early
girl	chapter	opposed
was	page	every
key	title	form
far	author	of
may	publisher	tyranny
who	preface	over
knee	reference	man's
spin	heading	mind
roll	footnote	and
stay	index	body

no. of trials _____ no. of trials _____ no. of trials _____

Task 2, continued.

b) *Esperanto*. In most learning situations in school, even when verbatim learning is required, you do not see just one item at a time but a whole poem or rule or theorem or whatever it is you are to learn. You get to look back and forth to check similarities and differences and see relationships between the various parts.

Much memorizing, too, involves not only learning to say a new word or sentence, as in part a, but associating the new item with something you already know. Thus, to commit a new response to memory may involve (1) only a new response or (2) a new response associated with or seen as equivalent to an old one. This latter is the case in learning shorthand or a new language. The pupil who has already learned the symbol "house" to represent his experience of "house" now must learn a second symbol for the same experience. At first he must translate the second symbol to the first one each time in order to see the meaning. Eventually the second symbol becomes as direct a representation of experience as the first one, and he can think in the new language.

Below are several sentences in *Esperanto* with their English equivalents.¹ Study them until you think you know them all, then turn the page.

Kiu estas tie? *Who is there?*

Estas mi. *It is I.*

Eniru. *Come in.*

Kiel vi sanas? *How are you?*

Tre bone, mi dankas vin. *Very well, thank you.*

Vi alvenas gustatempe. *You arrive just in time.*

Mi neniam vidis tian aferon. *I never saw such an affair.*

¹Languages are more efficiently taught by methods other than the drill of isolated words and phrases but the purpose here is to give you an experience of learning in which both a new response and an association with an old one are involved.

Task 2, continued.

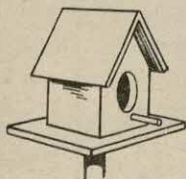
Translate the following into Esperanto:

there _____
 how _____
 just in time _____
 affair _____
 it is _____
 I _____
 who _____
 you arrive _____
 never _____
 It is I. _____
 How are you? _____
 I never saw you. _____
 Is it you? _____
 Who is just in time? _____
 Very well, thank you. _____
 Come in. _____

Now go on and perform Task 3.

Task 3 REMEMBERING OBJECTS YOU SEE

Look at the objects pictured below for not more than 5 seconds. Then close the book and write down all you can remember.



Now turn to page 229 and complete Task 3.

SEQUENCE IN LEARNING—FACT OR FICTION

One of the truisms of teaching is that an orderly sequence of learning enhances meaningfulness—and probably few educators would argue with this. Nonetheless, it never hurts to take a new look at an old assumption. The author of this article examines some of the pitfalls of strict adherence to sequence in the curriculum and offers a fresh look at the kind of sequence that is indeed essential to learning. She concludes with some helpful suggestions on how a teacher can foster the right kind of continuity without reliance on artificially imposed sequence.

Once there was an art supervisor who convinced herself that young children would paint better pictures if they first learned to handle the brush. So she devised a sequence of experiences leading up to painting pictures with mixed colors. Step 1 was to paint in the air with a dry brush. Step 2 was to paint on the blackboard with plain water. Step 3 was to paint on paper with only one primary color.

At that point the children took over their own sequence for they discovered that their neighbors had another color and that it was easy to trade paint brushes or to dip into the neighbor's jar with one's own brush. The children skipped right over Step 4 and 5, painting pictures first with two primary colors, then with three, and proceeded directly to Step 6, mixing their own colors.

The words *sequence in learning* call other pictures to mind: carefully worked-out programs to lead students step by step toward a new piece of knowledge, otherwise known as programed instruction; a plan for helping children memorize addition facts before they are asked to deal with subtraction; a requirement that letters and their sounds be mastered before words are presented in a reading class. All of these suggest someone's notion of sequence in learning.

Unquestionably, there is sequence of a sort in all learning. One event certainly follows some other event in the period of time between a stage of no knowledge or skill in a particular area and the point of rather full control of an idea or a skill by an individual. A child will not learn to assign correctly the general classification of *father* to only certain men until he has had enough experience to generalize upon. To take another example, a child surely must have some exposure to a language before he can communicate with others in that language.

But to agree that there is sequence in learning is not to say that all of our assumptions about natural or normal sequences are valid. In fact, certain long-held assumptions are turning out to rest on a shaky base.

Traps to be avoided

There is danger in *insisting that great masses of children follow indefensible sequences in learning*. Some years ago students of child development could state positively that most children used separate words as they began to talk and only later joined them to make connected sentences. Now young children brought up on a diet of TV viewing babble in patterns that have the rhythm of complete sentences before they say anything distinguishable to another person. Their first meaningful talk also comes in the form of complete sentences.

Old assumptions about the best order of learning mathematics are being questioned. Few believe any longer that mastery of addition must precede introduction to subtraction or, for that matter, that arithmetic must be fully comprehended before geometry or algebra can be approached. The many children who have been given a chance to learn mathematics in a different sequence have shown how mistaken the former conviction was.

Some notions about sequence die hard, however. An example is the logically appealing one, currently being revived, that in social studies children should start with a supposedly simple primitive culture before attempting to understand a complex modern one.

Another trap to avoid is to assume that *all children necessarily go through the same sequence in arriving at a similar point in learning*. We cannot assume that a sequence that appears to be useful or even necessary for many children is a requirement for all.

Most children learn to talk after hearing others talk, but not so with deaf children. They must have a different sequence. Many children may seem to benefit from fraction disks in working out certain arithmetic problems, but a few are ready to work directly with numerals and should not be forced to use semiconcrete materials that they do not need. Children who come to kindergarten or first grade already knowing how to read should not be put through the same beginning reading paces as other children. Not all children learn spelling in the same way, so it is wasteful to make each one go through the same elaborate process of word study.

There is the indefensible assumption that *progress should be steady*. For example, no adult chooses all of his reading matter at the "stretch" level, yet we worry if a child elects now and then during school time to read a book that we believe is too easy for him. Studies of patterns of book selection by children in individualized reading programs show that children vary the level at which they read, sometimes choosing a more difficult book, then seeming to rest with one that can be finished with little effort. No teacher can make such a decision for a child.

Nor can a teacher know just how many explanations and practice periods will be required before each child in his group has caught on to a new process in arithmetic. Sometimes children who seem to be making no progress but are allowed to work in an unpressured way arrive at a point of clear understanding quite suddenly and unexpectedly to both themselves and the teacher.

The most subtle trap of all lies in the widespread belief that *sequence in the curriculum means an ordering of topics to be studied* in any one area of the curriculum. The problem of curriculum planning then becomes one of deciding whether "the postman" or "transportation" or "Indians" belongs in second-, third-, or sixth-grade social studies, if at all; in which grade children should study their own state, rocks, and long division; and a host of other topics.

The difficulty is that there are so many possible topics and so many equally good orders of topics. In social studies, in particular, to include any one topic, important as it may seem, is to leave out a dozen others that are as easily justified.

Another questionable belief about sequence in learning is that the *coverage of a topic is in itself a guarantee of any particular level of intellectual activity or any progress in understanding basic concepts*. Children may go through their early schooling dealing with subject matter in a most elementary fashion, limited to memorizing facts and relating one fact to another in the same simple way, whether in nursery school or sixth grade. They may experiment with magnets in kindergarten and again in fourth grade without deepening their understanding of magnetism. Another weakness of determining the stage of learning by checking off completed topics from an ordered list is that in spite of collecting a considerable amount of information in social studies, the learner may fail to develop social skills and good feelings toward his fellowman.

Sequence or continuity

Perhaps the idea of sequence in learning would present fewer traps for teachers if it were placed in the context of continuous progress of each learner, often referred to as the *overall continuity* in education. *Continuity* comes from a Latin word meaning "hold together" and implies concern with how the parts of the educational process hold together to build something of worth. *Sequence* comes from a Latin word meaning "follow"; therefore, the concern is with the best order of educational activities for achieving a specific, limited goal.

A useful program of education will contain many learning sequences. But no matter how they are ordered in relation to one another or what follows what, ordered sequences cannot add up to a complete education. They cannot guarantee continuity in a person's overall development.

There is continuity in development if there is forward movement. What is carried forward by the individual must contain stable elements that make a connection with the individual's past, but the elements must be sufficiently transformed to meet new conditions and expectations in the individual's present and future.

Desirable continuities in development

Elementary school is a place where children can expect help in becoming the kinds of individuals they want and need to be in order to live with satisfaction to themselves and others in the world that is emerging. Such living requires that children be informed (or be able to become informed) on matters of import in their work, community, and family; that they care about what happens to others and to themselves; and that they be able to relate with dignity and warmth to fellow humans.

This means that in the long run we should be concerned with each child's continuity—

- In the development of strategic concepts.
- In the development of ways of processing information.
- In ways of feeling about and relating with people.

Let us consider how much continuity may be fostered and what is the role of various learning sequences in the total process of education.

Continuity in concept development When abstract ideas or strategic concepts are set forth as the threads of continuity in a curriculum, the design of the curriculum differs greatly from that of a topic-centered curriculum. Suppose, for example, that teachers of children of different ages in a school agree that the concept of *change* will be one thread of continuity in the curriculum. A wide choice of topics in different subjects thus is opened for use in gradually widening and deepening such a concept—changes in weather and seasons and their concomitant effects; changes in color when paint is mixed; changes in the use of land over a period of time; changes in living following certain inventions; changes in mathematical operations; changes of key in music—the possibilities are endless.

Of course, the master teacher will know better than to announce: "Now, children, I am going to teach you the concept of change" and proceed to present the children with generalizations leading to this concept. Out of many examined experiences, children can come to their own conclusions, often sensing the importance of the concepts long before they make such declarations in precise language. They must come to feel comfortable in a world where change is the expected phenomenon and become interested in how human beings achieve enough stability to cope with change without either stagnating or going berserk.

Certain concepts, such as *justice* and *responsibility*, are people-centered and, thus, value-centered. But these concepts may still be approached through one or more sets of specifics chosen from many. Therefore, teachers are free to select events and problems at the growing edge of society, matters not yet in the textbooks but ones that have great meaning for children. Such material may help children build strong, basic concepts that serve as cement in building sense out of the bewildering world of happenings. As Whitehead (1929, p. 3) wrote:

From the very beginning of his education, the child should experience the joy of discovery. The discovery which he has to make is that general ideas give an understanding of that stream of events which pours through his life, which is his life. . . . The understanding which we want is an understanding of an insistent present.

Other concepts that give the teacher a wide choice of subject matter are *interdependence*, *variety*, *authority*, and *order*. In building toward any of these concepts, various specific learning sequences will be required. For instance, in developing a concept of *order*, a useful activity might be the study of some of the ways in which the local community, the state, and the nation manage the problems of many people living and working within a certain geographical area.

Continuity in information processing Thought processes may also furnish a thread of continuity in a curriculum. The most thorough and complete example of such a curriculum design is *Science, A Process Approach*, a series of teacher texts worked out by the American Association for the Advancement of Science (1965 and 1966) for use in elementary schools. The entire set of materials is meant to help children develop several levels of intellectual skill—comprehension, application, analysis, synthesis, and evaluation of knowledge.

Taba (1964), in her studies of how elementary school teachers may improve children's thinking, has arrived at three levels of cognitive tasks:

- Grouping and labeling
- Interpreting and making inferences
- Predicting consequences.

She has found that with each new topic for discussion it is essential that the children have ample time to deal with specifics at the first level of grouping and labeling in order to have success in manipulating information at the other two levels. Again, sequences in learning that are on target appear to be useful as a part of a broader forward movement along a continuous line of development.

Those interested in enhancing creativity in children's thought processes will want to consult the work of Torrance (1962), who has concerned himself in particular with sequences of experience in developing divergent thinking.

Continuity in social relationships A third essential thread of continuity in the development of a person is maintenance of good feelings toward self and other people and skills of relating with fellow human beings. Concern with intellectual development need not, in fact must not, preclude development of a person who cares about people. Concepts of *justice, loyalty, brotherhood of man, interdependence, trust, and responsibility* must be tested and refined in actual living or they are worthless.

Specially designed learning sequences are just as necessary for maintaining this thread of continuity as they are for the others. The inequities, cruelties, and neglect suffered by many of the world's people will require widespread participation in efforts that are informed, skillful, and warmed by the heart. For this reason careful planning of experiences leading to responsible social skills should receive high priority among teachers of fours and twelves and in between.

Arrangement for fostering continuity

If we are to give up such comfortable habits in curriculum planning as depending on sequences of topics arranged according to some logic, we must have something defensible to count on instead. Four kinds of help seem to be possible:

- Pooled judgment of adults
- Help from the children themselves
- Help from research on children
- An open curriculum design.

Pooled judgment of adults To foster continuity in the development of a person requires adults to project into the future to gain a long-term view of the child and to decide on a few key emphases for which the teacher and, we hope, parents, too, will assume joint responsibility. Whatever the organizing center is—be it concepts, processes, or topics—let each be selected thoughtfully and let it become the peg on which broad experiences may be hung. In this way children's thinking and emotions and social well-being may all be advanced together.

Each teacher who assumes responsibility for a child for a year or more ought to know and care about where the child is at that time and what school and home have contributed so far. His planning and his teaching ought to reflect this knowledge and feeling. Even after the child moves beyond his direct guidance, the teacher should continue to care about and help plan for the child's well-being.

A group of teachers with shared responsibility for groups of children ought to gather and weigh all the evidence they can on the continuities or lack of continuities in each child's total development. Their further planning and action should reflect their findings on the child's successes and failures to date and should be based on the best ideas each teacher can contribute for helping children to progress.

Help from the children themselves A learning sequence is an external affair, an ordered series that can be planned and provided by someone other than the person to be educated. It can, in fact, be designed for the use of many individuals and groups.

Continuity in the development of a person is an internal affair, a movement difficult to observe and one which cannot be managed by someone else. Even if a teacher were to have a class containing only a single pupil, he would not have sufficient information, without help from the child, to dictate his every step in education.

A teacher who desires to promote continuity in the development of each young person in his charge will do well to take the children deliberately and openly into partnership. Not only will the children make more progress along lines that they have selected, but they will be taking steps toward independence in learning.

The teacher who invests time in planning with his group how they will use the school day and together manage their shared classroom space and facilities will make gains for himself and the children in time, ideas, and motive power. This may be supplemented with guided opportunity for individuals to make certain decisions about their own use of time within the overall framework. The chances that individuals will make continuous progress are greatly heightened by such a procedure.

Help from research on children When a teacher departs from familiar external sequences, he seeks a specific kind of help from research, such as ways of reading clues in children's behavior regarding points where they need and are ready for assistance and ways of picking up cues from them as to where the teacher may enter in with a suggestion of activity or material or a question to clarify or stir up thought.

Vygotsky (1962, p. 104) has written on this point:

What the child can do in cooperation today he can do alone tomorrow. Therefore, the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe as at the ripening functions. It remains necessary to determine the lowest threshold at which instruction in, say, arithmetic may begin since a certain minimal ripeness of functions is required. But we must consider the upper threshold as well; instruction must be oriented toward the future, not the past.

Hunt (1961) has used the term *finding the match* to express the same idea of locating the “ripening function.” Almy (1966), as well as Hunt, is helping American teachers make use of Piaget’s study of Swiss children. Wann and associates (1962) have reported on work with teachers who are helping young children in their struggle to master concepts. As more teachers make and share their own discoveries about useful ways of helping children move ahead, all of us will be the richer.

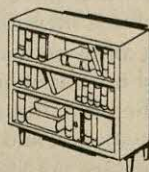
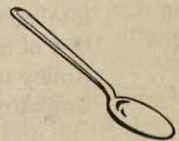
An open curriculum design Teachers will be helped in using new ways of organizing their students’ experiences if they are released from fixed sequences in learning and encouraged to use sequences that are more appropriate for their own children. Just as important, teachers will need to release themselves from unfounded notions about learning sequences.

If children are to make overall continuous progress in their development, their days must be varied and flexible. Time allotted for a particular activity should be stretched or shortened as teacher judgment and child readiness dictate. Children should also be provided with the opportunity to secure different perspectives. The idea of securing different perspectives—great depth on one occasion, a mountain-top view on another, cross sections, closeups, comparisons, patterning of raw data, panoramas—can be applied using varying subject matter as well as returning to the same area of content.

Conclusion Sequence in learning is fact not fiction. If introduced to help a particular child when he seems ready to profit from it, a learning sequence becomes a part of a larger movement in the overall development of that person. Thus the continuous growth of each learner is provided for. Sequence in learning is useful only as it preserves continuity in education.

Task 3, continued from page 222.

You may not have noticed that the pictures you just saw consisted of four pairs of objects (such as a bird and a birdhouse) rather than eight unrelated objects. Now look at the pictures below for not more than five seconds; then close the book and write down all you can remember.



Now turn back to page 207 and continue reading.

KINDS OF LEARNING

In guiding any kind of learning, good teachers strive for clarity and meaning and an involvement of learners that will lead to use of the learning in new situations where it is relevant, both in school and outside it. But over and beyond the general principles discussed in Chapter 7 are others that apply to the teaching of specific things children learn in school. In this chapter you will examine principles for guiding specific learning.

Some of the specific learning outcomes that children need in order to reach maturity are:

- Accurate facts, information, knowledge about oneself and the world
- Concepts, generalizations, principles, understandings
- Skills in communication and quantitative thinking
- Competence in social and vocational skills
- Attitudes, convictions, opinions, goals, values, ideals
- Ability to solve problems, to meet new situations effectively
- Creativity and flexibility
- Intelligent self-direction
- Use of one's capacities
- Ability to love beyond oneself
- Empathy – the ability to put oneself in another's place and feel as he does

These are all components of maturity, and they are obtainable only through learning. No child is born with them or develops them through maturation alone. But every child must learn them somewhere, somehow, if he is to become a mature adult. Not all of them have been traditionally regarded as the school's responsibility. But the schools increasingly are accepting part of the responsibility for helping children with all these learnings.

These learnings may be classified broadly into the several curriculum areas. They may also be classified into these categories: skills, concepts and generalizations, problem solving, creativity, and attitudes. Although these are different kinds of learning outcomes, they are not likely to occur separately, one at a time. As you

saw in the case of Scott when he was fixing the wires for the doorbell circuit, concept learning involves other learning.

In the rest of this chapter you will examine special keys to efficient teaching and learning of skills, concepts and generalizations, problem solving, attitudes, and a creative approach.

LEARNING SKILLS

Skills are efficient ways of doing. Anything you do can be done either skillfully or ineptly; but usually a skill can be developed and improved. The end result the teacher hopes for in skill learning is twofold; first, the development of the skill, and second, a habit of using it in situations where it is appropriate.

Any skill involves both content of some kind and a sequence of action. Some skills, such as skills in group participation, are strong in emotional components. Others, such as typing or shorthand, may be developed with little emotional involvement. Some depend more heavily than others on perceptual and conceptual factors. Some are largely a matter of muscle training. You can develop skills in perceiving, forming concepts, remembering, and solving problems.

Many skills are actually a combination of several skills, some of which have been learned in connection with other activities. In your daily dash to make an eight o'clock class you may become an expert at quick dressing, timing your trip across the campus, and wheedling your roommate into saving you a roll for a late breakfast. These skills, once developed, can be used in new situations. Just as you bring knowledge and attitudes from the past to a new learning situation, you also bring many already developed skills.

In the discussion to follow, we shall focus on motor skills. Most of the research on skill learning has been done in this area, and the development of a motor skill is easier to trace and analyze—and control—than the development of a skill such as getting along with people. As you read, however, and as you experiment with skill learning, try to translate your findings to other skills.

As with the other ways of learning, you will get more from this discussion if you can base your thinking on your own experience. If you have had the experience of learning to play a musical instrument or learning to swim or dive or type, you may be able to recall how your learning progressed, how the teacher (if any) helped, and what made the learning either hard or easy.

To give you and your classmates a further common ground of experience in motor learning, turn to page 285 and perform Task 4 before reading further.

In your brief attempt to learn to write with the hand you do not normally use, several characteristics of motor learning will have become apparent. We will discuss these characteristics in the next several sections.

Motor learning involves more than muscles

It will be apparent that the development of a motor skill does not mean that only motor learning takes place. Muscles are trained, but so is perception. New

concepts may be formed, new attitudes developed. Sometimes a problem must be solved. Usually there is social interaction of some kind. By way of example, let us consider an episode in which children learned a predominately motor skill.

For observation

DAVE'S CLASS LEARNS TO PLAY BASEBALL

When spring came the boys and most of the girls in Miss Simon's fourth grade developed a consuming interest in softball and played together at recess time in one large, disorganized group. Their "games" consisted mostly of choosing sides, squabbling over who would play what position, pitching some very wild balls, hitting a few, and striking out most of the time. After several days of this, most of the girls quit in favor of other kinds of games and the boys became increasingly frustrated over their lack of skill. Their dissatisfaction led to quarrels that spilled over into the classroom, threatening to become a disruptive influence.

Miss Simon thought she saw the source of the difficulty and one day she opened up the subject of baseball. The boys responded readily and noisily. When she asked them how their games were coming on, Dave commented wistfully that the games were OK "but I wish I could hit like Johnny does."

Most of the others chimed in with the same complaint. They said they thought they were pretty good at throwing and catching, but at batting they were "awful." And batting was the most important thing, as they saw it. They were concerned about their lack of skill and Miss Simon agreed to help in whatever way she could.

"What do you think you could do to develop more batting skill?" she asked.

"My father pitches to me so I can practice," one boy offered. This led to a general discussion of various ways to increase batting skill. Out of this came six specific suggestions which were listed on the board.

1. Practice more.
2. Take pictures of how we bat. (One boy had heard about this being done.)
3. Write down how to do it first, then try it.
4. Have Johnny tell us and show us how.
5. Get somebody to show us how to bat—somebody older who is good at it.
6. Read about it.

"Now that we have definite suggestions," Miss Simon said, "let's go down the list one by one to see how practical each one is. Can you practice more?"

Everyone agreed that practice was necessary. But it seemed that everybody already got as much practice as there was time for. Most of the boys played ball not only before school and at recess, but also after school nearly every day. And Saturdays were given over to sandlot games. All of them said they intended to continue practicing just as much as they could. So it was not want of practice that accounted for their poor performance. Obviously, just playing was not enough. Something else was needed.

The idea of pictures was taken up next, but was soon discarded as impractical.

The best way to test the third suggestion, the class decided, was to try it. In a few minutes every head was bent over paper and pencil. Dave thought and thought, and chewed on his pencil, and thought some more. But he just didn't know what was wrong with his batting so how could he write it down? The same thing was true of the rest of the class.

Miss Simon had been expecting this and was ready to listen to another plan. Dave gave the cue by suggesting they go outside to have Johnny demonstrate. "Show us how and tell us, too," he urged Johnny.

Out on the playground Johnny showed how he held the bat, and the shorter grip he used for a heavier one. He rested the bat on his shoulder and swung from there. After watching Johnny, the other boys and some of the girls took turns at practice swings.

As he went through the motions, Dave recited to himself, "Take a grip like this. Keep your eye on the ball. Swing hard."

Once in a while, to everybody's excitement, there would be a good hit. But most of the time the boys swung and missed. They were so self-conscious that they looked more like Ichabod Cranes than World Series heroes.

When they came in from the playground, the boys showed signs of restlessness and uneasiness. Miss Simon had anticipated this and, instead of beginning a new activity, took advantage of the high pitch of interest in baseball to talk it over. She encouraged them by reminding them how slow progress is and how learning takes time.

"As we try new ways we have to get used to them and it slows us up for a while," she pointed out.

Dave felt a little better after this. He had begun to wonder if he were "too dumb" to learn. His self-esteem had suffered and the easy success he had dreamed of was obviously going to be slow in coming.

"Well, we haven't tried all our suggestions yet," Miss Simon reminded. "If you would like me to, I am sure I can get a coach to come over from the physical education department."

The spirits of the children revived. They were unanimous in accepting her offer.

"It might help us to do some reading, too," Johnny put in. Miss Simon said she knew of several good books on baseball and baseball players and wrote their titles on the board.

On Monday Dave was a little late getting to school, but the news that the coach would be there for the morning game period was already the topic of conversation. Some of the girls wanted lessons too, and this involved more planning.

When the hour finally arrived, the class joined the coach on the playground. He joked with the children for a few minutes and then got down to business.

"All right, let's get started," he said. "I want to see everyone try some swings."

Afraid that he might miss, Dave was reluctant to try until the coach assured them that this first swing was mainly to help him see what they needed to know.

The coach watched everybody try a few swings, then called them around him for some instructions. First, he showed them the difference between being

relaxed and being tense. Then he broke up the art of batting into stages. He showed them how to stand at the plate, how to grip the bat, where to rest it, how to keep their eyes on the ball at all times, and how to swing.

Here and there the children had questions. Dave wanted to know why some big players were pinch hitters and some had high averages. The coach explained that differences between players could be due both to practice and to strength.

"Some players are built better than others for pitching. Some are built better for batting," he said. "But everybody can learn to play well enough to have fun." As he saw it, all of the fourth-graders could improve a great deal with instruction and practice.

Some of the boys had brought their own bats from home and shared them with the others. Dave tried out the new instructions as the coach went from one child to another, correcting the position of their feet, and their grip on the bat. It wasn't easy to remember everything at once, Dave found. Getting all the steps into a smooth, integrated pattern was his biggest trouble. But gradually the series of movements became more coordinated. He began to feel how it went and could say whether or not he was doing it right. The coach had the children practice in pairs, taking turns watching each other and pointing out defects as well as good points in the other's form.

At the next session the fourth-graders were ready to try hitting pitched balls. On his first turn Dave tried hard for a home run and succeeded only in fanning. Most of the other boys and girls had similar experiences.

"Let's go over what we learned last time," the coach advised. He took them back over the steps to refresh their memories and suggested they try for easy, controlled hitting, rather than attempting to hit just as hard as they could.

The practice session went well after this. Dave's hitting was growing better. He felt more confident of his ability and proud of his gains. Almost everybody showed improvement. All were loud in their praise of each other. It made Dave feel so good that he suggested the fourth grade take on the fifth grade in a game "after we have practiced enough."

The coach worked with the group off and on for several weeks. At times Dave forgot what he had learned and returned to his old ways. But as he played almost every night after school, he could feel more and more surely what was "right." Although the muscle to be a great batter simply was not there, he reached a good state of coordination for a boy at his stage of development. Eventually, he was rewarded regularly by the resounding crack of the ball striking the bat squarely.

Even after he had finished his regular sessions with the children, the coach returned occasionally to check up on the latest developments. Each time he praised the improvement he saw and made additional suggestions. Miss Simon, too, commented often on the group's improvement. Dave loved to show his increased skill to her. In one composition he wrote late in the spring he told the story of a young ballplayer who got some tips from an old hand and turned out to be the leading hitter in the league.

As we look more closely at this natural history of a learning experience, we can discern some of the important factors in it. For one thing, we can see that this particular learning activity meshed closely with the interests and motivation of the group. And, since this was the case, the coach did not find it necessary to intro-

duce extraneous rewards or punishments into the situation. Evaluation of progress was not done by the coach alone, but by all participants. In fact, they were their own severest critics.

We know that the children were motivated to practice and spent much of their time out of school trying on their own to improve performance. But this had been largely futile because for the most part they had been practicing errors and, instead of improving their batting skill, they had stayed at the same level or gotten worse. What did the coach do that would go undone in an unsupervised group? In order to answer this question, let us consider some of the important elements involved in the learning of skills.

Skill learning starts with the desire to improve

You usually have to want to learn a skill before you will do so. You saw the importance of this for Dave's learning. Merely going through the motions does not ensure learning. You may stand, sit, and walk for years without improving your posture; you may write innumerable reports without improving your handwriting. Usually, in order to improve, you have to try to improve.

If you wrote "learning" thirty times just to get it over with, without deliberate intent to improve, you probably did not improve. You may not have improved much anyway in such a short trial, but you can see what a difference intention makes in whether a skill is learned or not. Each time you make a mistake that you recognize as a mistake, you have a chance for self-correction. But if you ignore your mistakes, then naturally you will continue to practice errors. Wanting to improve helps learning by making one attentive to such clues.

Sometimes a learner's intention is vague or unrealistic. He may need help in identifying the goal. If you had asked the boys in Dave's class what their goal was, they probably would have answered "To play baseball." Such general, undifferentiated goals hardly would have been sufficient to guide their activity. They had to learn to look at the various aspects of the activity, how to stand, how to hold the bat, just when to swing, and so on.

You do not learn to play baseball all at once. Nor do you learn to produce a finished table in one lesson in the shop. Yet the pupil at the start often has his eye on just such a goal. When he does not play well after a few sessions at the piano, he becomes discouraged. One of the teacher's biggest jobs is to help students set realistic goals and subgoals.

A model can be helpful

Sometimes the student does not have a clear picture of the desired act. He may not understand about the lathe operation, for example; or sometimes he has a vague, inaccurate notion of the dance step or the correct golf swing. To overcome this difficulty the teacher can present a model. Movies, field trips, demonstrations, or guided and supervised coaching may be sufficient to start the pupil on his way toward adequate accomplishment. The coach swings the bat with the beginner, thus creating the needed image.

When pupils can participate in the demonstration, questions can be answered as they arise, needed practice can be suggested, and variations of technique can be pointed out. As in the case of Dave's class the teacher himself need not be the model: he can turn the function over to experts or to members of the class. But the desired response must be made clear to the learner.

Skill learning requires practice

It will be apparent that you could not possibly learn a skill by reading or hearing about it. You have to go through the motions. Practice is necessary. Those who excel in a motor skill have usually devoted many hours to practicing it.

Practice enables you to keep checking your kinesthetic (muscular) perceptions against your visual ones to correct the errors your muscles make at first. Without this kinesthetic sensitivity, you could never make the corrections. Years ago, one experimenter found that blindfolding basketball players, forcing them to be more alert to kinesthetic cues, led to better learning (Griffith, 1928).

You can see why lengthy verbal explanations and directions are ineffective, especially at the start. Beyond a quick overall picture of what is to come, words are largely wasted until after the learner has had some trials of his own.

After the learner has begun to get the feel of what he is doing, the teacher can use words to help clarify further his perception of what is needed. Verbal instruction often can be quite effective at the highest levels of proficiency.

Knowledge of results is essential

You cannot improve unless you know when you have made a mistake and what it was. Blindfolding the basketball players could work only if they were told the results of their throws.

In your handwriting task, you could get this information easily by yourself, but in many cases errors are not immediately apparent to the learner. Often the teacher must help the learner identify both errors and correct actions and thus discriminate between them. This knowledge of correctness or incorrectness of an action is called *feedback*. The clearer the feedback and the closer it comes after the act, the more efficient the learning can be. On each response the learner is testing a "provisional try"—his image of what the act should be. This becomes more precise and more accurate as learning progresses.

Corrections are best applied before extensive practice has been undertaken. Otherwise the errors may be consolidated instead of the correct actions.

Sometimes learners are able to help each other when the model has been clearly presented. Ordinarily, however, only the *general* form is taken in at a demonstration made before trials begin. If demonstrations are repeated, new details will be seen as the learner's own experience increases.

Motor learning follows a sequence

Even in the short attempt to learn a new pattern of writing you could probably see the sequence by which a motor skill—or any other skill—develops. First there is a

mass, undifferentiated, uncoordinated approximation of the goal. You probably used your whole hand at first, maybe your whole arm. A six-year-old, learning to throw a ball, throws with his whole body.

Next, you began to pay attention to special details. Perhaps you concentrated on the curves between letters or on getting a smooth loop at the top of the *l* and the *e*. In different trials, you concentrated on different details.

Without a teacher, you had the problem of discovering the best way to proceed. Before long, you may have experimented with different ways of holding the pencil or different relative positions of book and pencil. You probably found yourself trying to control the motion of the pencil with your thumb and third finger.

Some of your attempts were undoubtedly much better than others. There was fluctuation both up and down. If you continued to practice this skill by practice periods several times a day for a month, there would be much less variability by the end of that time, but there would still be some. You would have settled on a way of holding the pencil and a position for the paper. Your movements would be smoother and probably more rapid.

There might have been plateaus—periods of no apparent progress. Usually in motor learning there is rapid improvement at first, then a slowing down and often a plateau. Sometimes this plateau means that the learner is changing his method or is consolidating a higher-level pattern of actions. Sometimes greater precision is needed which, in turn, requires finer discrimination or new insight. Sometimes interest falls off, or the learner is satisfied with his present level and does not see the need for further improvement. Harder work is often needed for further progress after moderate proficiency is reached.

Sometimes a method must be changed before further improvement can take place. For example, you can get up to a certain speed in typing by the “hunt and peck” system, but to type faster, you have to learn to be guided by touch instead of by sight.

Organization of practice periods

By the thirtieth try at writing “learning,” you had probably made about as much improvement as could be expected for one practice period. In fact, the last few attempts may have been worse than some of the early ones. Practice periods for motor skills should be fairly short, especially in the early stages. With increasing proficiency, the learner can profit from increasingly longer practice sessions. A professional musician may need and be able to profit from four or five hours of practice a day. Half an hour may well be the maximum for most music pupils below high-school age.

In regard to the whole-part problem, Ragsdale has the following advice for the teacher:

Some motor activities are closely knit units, others are loosely organized aggregations of units. A swan dive is an example of the first; a game of baseball of the second organization. It seems clear that the closely knit unit should be first attacked and practiced extensively as a whole. The units of the loosely organized activity may be, and often are, separately

learned over a period of years and then fitted together into a new activity. The child learns to throw a ball, to catch it, to strike with a club, to run, to slide, to accept special assignments in a group. Each of these activities is a self-sufficient whole when learned. Baseball is a later and higher-level organization. However, when baseball is begun, it is essential that the concept of the game as a whole be developed at the beginning; then each of the part-activities may be further learned, modified and perfected in relationship to the game as a whole. (1950, p. 85)

He also suggests that part-practice should be alternated with whole-practice, so that parts can be constantly adjusted to an integrated whole.

Teacher evaluation and encouragement

If a teacher had been trying to help you learn to write with the "wrong" hand, he could have checked your written results, but he would have failed to see the particular things holding you back in the written results alone. A teacher of skills needs to watch the learner in action to see if his methods are right. Watching him in action may also reveal faulty equipment or faulty working conditions that would not be apparent in the finished product.

The more expert the learner, the more able he is to evaluate his own performance. In the early stages, when he is still trying to identify the correct sequence of action, he will find a teacher's evaluation useful if it is a diagnosis, given to help subsequent learning, and if it helps him make the needed identifications. Evaluation given only in the form of a grade does not give him the specific help he needs and may discourage or threaten him instead of motivating him to greater effort.

If learners are told at the beginning that the early spurt will probably slacken off, they will not be so discouraged when it happens. If they realize in advance that later progress will be slower and will take harder work, they will not have such a feeling of frustration and failure when they see themselves slowing down. And if the teacher realizes that skill learning is bound to have ups and downs and plateaus, he will not expect continuous progress. If he keeps reminding himself that all children cannot learn at the same rate or reach the same level of proficiency, he will be alert to see what each child's limits are. This is as true in the learning of group skills or reading and writing skills as it is in the learning of motor skills.

Ensuring use of new skills

Ability to use the touch system in typing does not ensure that you will use it when you are in a hurry to type a paper for class. You will probably revert to two fingers plus eyesight in emergencies until you become so proficient at the touch system that it is faster and easier for you than the old way.

If you are to use a new skill habitually, as a matter of course, in situations where it is appropriate, two conditions must obtain: (1) you must learn it to the point where it is automatic and easy for you, or at least easier than any other way,

and (2) you must instantly see its relevance in new situations where it is appropriate. This latter condition is no problem in skills like typing or piano playing. But in such skills as leadership and cooperation, your recognition of their relevance might not extend beyond the types of situations in which you learned them. This is why it is so important for the contexts in which new learning takes place to be broad and varied—why drill on isolated responses often fails to produce learnings that are later used in real-life situations even though classroom performance may have been letter perfect.

Associative learning

The example of the pupils in Dave's class learning to hit a baseball may also be discussed in terms of $S \rightarrow R$ theory. Such an activity is an example of a complex sequence of behavior in which a large number of specific motor responses are connected into what is known in psychological terms as a "chain." Since simple stimulus-response learning is seldom seen in human behavior, at least outside rigidly controlled laboratory situations, the associative learning at the human level is usually in the form of complex series or "chains" of $S_s \rightarrow R$ units.¹ A chain may be predominately motor, as in dialing a call on the telephone, or it can be predominately verbal, as in reciting a poem.

Before a chain can be established, the individual responses that go into it must be learned. The task then is one of connecting the specific parts into a smoothly coordinated sequence. Each response in the chain provides feedback, which becomes part of the stimulus for the next link in the chain.

Now, with these things in mind, consider the children in Dave's class learning to hit a baseball. This is a relatively complex example of chaining.

Some of the links in this chain had already been learned by the children—picking up the bat, holding it firmly, standing with the feet in a certain position, running from one place to another. But there were certain links in the chain that had not been learned and it was on these that the coach concentrated first.

For one thing, although all of the children could of course pick up a bat and hold it, most of them did not hold it correctly. Some of them did not position their feet correctly, and some did not keep their eyes on the ball as it traveled toward the plate. In fact, one boy would shut his eyes just before the ball got near. A few of the children, if they did manage to hit the ball, would stand and watch it go instead of running immediately to first base. If the fielding was any good, they were tagged out at first.

Now consider what the coach did. First of all, he broke up the skill into its component parts—the links in the chain. He showed the pupils how to grip the bat, how to stand at the plate, how to watch the pitcher and keep their eyes on the ball, how to swing, and so on. In each case he showed them how, that is, he provided a *model* showing the correct responses. He also gave them verbal descriptions and directions, thereby providing certain *cues*. He checked each player on each step and when the particular response was correct he provided immediate feedback by saying "Good" or "Fine" or clapping a player on the back approvingly.

¹The small *s* is used to denote internal stimuli.

When each child had mastered the various parts reasonably well, the coach helped them to put the steps together—that is, to chain their behavior. The children found the fusing of the separate elements into a smooth sequence to be the most difficult part of the learning task. Gradually, however, they began to “get the feel of it” (kinesthetic feedback) and their movements became more coordinated. In the meantime, the coach continued to watch their movements carefully, giving verbal cues by making suggestions and pointing out errors, giving a word of praise and approval whenever the right response occurred. These intermediate reinforcements were very important in establishing the chain, but the most important reinforcement came when the batter felt and heard the impact of his bat on the ball and saw the ball traveling off into the outfield.

It probably would have been easier for the coach to shape the behavior of the children if he could have started with them before they began to try to bat at all. The children had already formed, or partially formed, chains of batting behavior but these for the most part were completely ineffective, either because some of the links in the chain were poorly learned, or because they were inappropriate. Thus, the coach was confronted not only with the problem of shaping effective batting skills, but also with the necessity of eliminating existing incorrect responses.

The process of unlearning of a single $S \rightarrow R$ or chain of behavior is known as *extinction*. In the absence of reinforcement, a response becomes progressively weaker and ultimately disappears. This phenomenon is easy to demonstrate under laboratory conditions but in the case of the coach and his teaching problem the situation is more complex.

It was perhaps fortunate that the $S \rightarrow R$ chains the children in Dave's class had established before the coach came to help them were not more effective than they actually were. If the terminal reinforcement (a hit) had occurred more often, the inefficient chains probably would have been more reliably established and extinction would have been more difficult. Even so, the coach had real difficulty in eliminating some inappropriate behavior (in holding the bat, positioning the feet, etc.) and substituting the correct responses. He accomplished this mainly by providing negative feedback (saying “no” or “that’s not quite it”).

There is much here that is of immediate value to teachers. One thing, obviously, is the importance of providing immediate feedback to the pupil when the learning task involves the chaining of responses. Another thing is the deleterious effect of permitting pupils to practice errors, for the probability of a learner's forming inefficient chains is very great and the learning situation is then complicated by the necessity of extinguishing wrong responses. In a classroom situation this process can be difficult and in some cases next to impossible.

This perhaps is clearest in the case of motor skills commonly taught in school—handwriting,² for example, in the elementary grades and typing in the secondary school. When inefficient chains are permitted to become established in these skills they can be exceedingly resistant to extinction. The same thing is true of verbal chaining. Teachers always find it difficult to eliminate ungrammatical

²Task 4, in which you tried writing with your left hand, involved some of the elements of motor learning that an elementary-school child faces in learning to write. However, the learning tasks are not identical because you already know the steps involved in forming the letters and placing them in proper sequence. You did not need verbal cues from a teacher in order to master the task because you could have furnished your own cues, and probably did.

verbal chains ("have did," "have went home") which have long been reinforced in the child's home and neighborhood. Yet, if proper speech habits are to be learned the old responses must somehow be extinguished.

LEARNING CONCEPTS AND GENERALIZATIONS

In order to retain and profit by our experience, we must be able to classify and compare our ideas and perceptions. New experiences and information must be fitted into the framework of existing knowledge—or else the framework must be adjusted to accommodate them. This leads to the recognition of patterns and the abstracting of elements common to many experiences and hence to the formation of concepts and generalizations.³

Perhaps the best place for you to start in examining these processes is with a personal experience in forming a concept. So before reading further, turn to page 285 to perform Task 5.

What are concepts?

A concept is an abstraction formed by generalizing from many experiences with particular things and events. It is general or universal in its application, and does not refer to only one member of a class. Thus a "mib" is not one particular figure but any figure with certain properties. Manhattan is an island; hence the concept *island* may properly be applied to Manhattan, but it may also be applied to any other body of land which is surrounded by water and is smaller than a continent. And it may be used in discussion and in thought independently of Manhattan or any particular body of land. Concepts, because of their abstractness, free us from particulars and make reflection possible.

How are concepts formed?

A concept, as you saw from your experience with the mib, is formed when certain qualities and relationships are seen repeatedly in a number of successive experiences. Through several trials you identified what qualities and relationships *were* part of a mib and also which ones were *not*.

The formation of concepts follows a developmental pattern.⁴ In a young child,

³One of the best short reviews of the process of learning concepts and generalizations is "How Children Learn Information, Concepts, and Generalizations" by W. A. Brownell and Gordon Hendrickson (Chapter 4 of *Learning and Instruction*. Chicago: National Society for the Study of Education, 49th Yearbook, Part I, 1950). For an interpretation of concept formation as a process of verbal chaining and multiple discrimination, see Chapter 5 in Robert M. Gagne, *The Conditions of Learning* (New York: Holt, Rinehart & Winston, 1965). A comprehensive technical analysis of concept formation is found in *Analyses of Concept Learning*, Herbert J. Klausmeier and Chester W. Harris, Eds. (New York: Academic Press, 1966). A much more extended discussion with a wealth of illustrative material and very specific references to teaching methods will be found in *Education for Effective Thinking* by W. H. Burton, R. B. Kimball, and R. L. Wing (New York: Appleton, 1960).

⁴For a detailed picture of how children's growth is related to the sequence and timing of their development of mathematical concepts, see J. Piaget, "How Children Form Mathematical Concepts" (*Scientific American*, 1953, 189 (20), 74–79).

concepts are usually vague and inexact. A two-year-old, for example, may call any animal a "bow-wow" and any woman a "mommie." Later he will differentiate between a "woman" and a "mommie," thereby sharpening both concepts. Still later he will be able to differentiate between class names and names of individual objects.⁵

A five-year-old may have grasped the main distinguishing features of an island although he may think it has to be a certain size or have trees on it. As he matures, and as he has more experiences with islands through seeing them, landing a boat on them, reading stories in which they figure, seeing pictures and maps and movies in which they appear, and using what he already knows to interpret new situations, the abstract idea or concept acquires increasing clarity and precision.

If he should become a geographer, his concept of "island" will grow even richer and more inclusive because he will have in his geographical training certain experiences with islands which the rest of us do not have. However, even the abstractions with which he will deal as a geographer will be rooted in his experiences. Without experience, a concept has no meaning for an individual.

The concepts you build up through experience with particulars you can then manipulate to build further concepts. Many of the concepts you learn, especially by college age, are several steps removed from actual experience with particulars, but your understanding of them still depends on such experience somewhere back along the line. Without it, the concepts would be meaningless to you.

Many concepts are developed without specific teaching. You probably developed the concept of the mib in this way. When a child learns a concept by himself, he builds it up gradually, as you did, through several experiences. Teaching can implement this formation if the teacher will supply the intellectual and sensory experiences the child needs and help him to see and identify the "figure," recognizing both what is included and what is irrelevant.

The danger in teaching concepts is that concepts can be *adopted* as well as *formed*; that is, they can be taken over ready-made by rote memorization. When this happens, the concepts have no roots in the child's experiences and little or no meaning to him. They are nothing but empty verbalism. He can repeat the language in which they are stated, but they will be of no use to him in interpreting novel situations or acquiring new learning.

Attempting to "implant" concepts rather than build them has been the great curse of formal instruction ever since there have been schools. All too often, methods of teaching, materials of instruction, curriculum organization, and methods of appraising learning have contributed to the perpetuation of empty verbalism.

Many of the stories, some of them quite funny, about students' "boners" on examinations and small children's misuse or misinterpretation of new words can be traced directly to imperfectly formed concepts or to pure, empty verbalism. It may come as a shock to a teacher to find that his pupils, in repeating the pledge of allegiance, are actually saying, "I pledge the legions" and "one nation invisible,"

⁵Important variables are hard to control and measure in studying as complex a situation as concept learning. For a study based on associationist assumptions, in which two conditions of concept learning were compared, see W. N. Rudquist and V. H. Hutt, "Verbal Concept Learning in High School Students with Pictorial and Verbal Representation of Stimuli" (*Journal of Educational Psychology*, 1961, 52: 108-111). Another study of concept learning at the high-school level is "How Significant Concepts Are Attained in High School Subjects," by W. C. Frederick (*North Central Association Quarterly*, 1966, 40: 340-345).

but such errors are quite understandable and probably more common than is generally realized.

An occasional boner may be funny in itself, but the kind of educational process which produces boners systematically is not funny. A classic story of empty verbalism, together with an indication of the kind of educational process which fosters it, is an episode told by William James in his *Talks to Teachers* (1899):

A friend of mine, visiting a school, was asked to examine a young class in geography. Glancing at the book, she said: 'Suppose you should dig a hole in the ground, hundreds of feet deep, how should you find it at the bottom—warmer or colder than on top?' None of the class replying, the teacher said: 'I'm sure they know, but I think you don't ask the question quite rightly. Let me try.' So, taking the book, she asked: 'In what condition is the interior of the globe?' and received the immediate answer from half the class at once: 'The interior of the globe is in a condition of igneous fusion.' (p. 150)

In today's schools we find many kinds of learning activity going on besides reading, listening, and reciting. Still, even the most activity-centered educational program cannot be divorced from conceptual learning. The never-ending problem of the teacher at any level is how to help children and youth form meaningful and useful concepts and how to escape empty verbalism. Even at the adult level the problem is difficult.

What are generalizations?

We can think of concepts as the very stuff of our intellectual experience. It is out of conceptual material that we fashion generalizations. The term *generalization* is easy to illustrate but relatively difficult to define. One definition, probably as good as any, is that a generalization is a widely inclusive statement of relationship. Therefore, all the laws of science, the rules of grammar, the theorems of mathematics, the principles of the fine and applied arts—in fact, a great part of all that is taught—are generalizations. They express relationships which apply universally in their fields.

When we say, "Every declarative sentence should end with a period," we are expressing a generalization about punctuation of the English language. When we say, "The square of the hypotenuse is equal to the sum of the squares of the other two sides," we are stating a generalization about a right triangle. Generalizations have long been the stock in trade of formal education.

Generalizations need not be verbal, however. A rejected child's generalization that all the world is cold and hostile is an emotional generalization in which words play little or no part. So is the generalization of a failing child that all schoolwork is beyond him. Yet such generalizations will be as important as verbal ones in shaping later perceptions and directing later behavior and learning. The teacher who wants to guide a child toward all-round maturity will be concerned about all the kinds of generalizations which children are making from their experiences in school.

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Generalizations need not be verbal, however. A rejected child's generalization that all the world is cold and hostile is an emotional generalization in which words play little or no part. So is the generalization of a failing child that all schoolwork is beyond him. Yet such generalizations will be as important as verbal ones in shaping later perceptions and directing later behavior and learning. The teacher who wants to guide a child toward all-round maturity will be concerned about all the kinds of generalizations which children are making from their experiences in school.

How are generalizations formed?

Generalizations can be formed only through the experience of the learner. You make generalizations by abstracting and reorganizing elements of your own experiences. You make formulations of universal relationships and then apply them to novel situations in your efforts to solve new problems and to understand new events. In this way you refine and correct your generalizations.⁶

Since a person's generalizations depend to a large extent on his perceptions and feelings, they may or may not be accurate. Many people hold generalizations that are false because they are based on insufficient evidence, or on evidence wrongly interpreted, or perhaps on wishes instead of evidence. Many generalizations that you know are false will readily come to mind: "A black cat crossing your path brings bad luck." "All foreigners are radicals." "Redheads are hot-tempered." The fact that these generalizations are false does not affect the fact that they have very real influence on the behavior of the people who hold them. In fact, one of the reasons it is so difficult to change racial, religious, and national prejudice is that often attitudes are anchored firmly in false generalizations that have been accepted uncritically.

A second difficulty lies not in the falsity of generalizations but in the problem of meaning. Here again we encounter the danger of empty words. Generalizations are made up of concepts. If a teacher tries to teach a generalization in which the concepts have no meaning to the learner, the generalization will have no meaning for him either. He will be able to "learn" only the words, and those only by a process of rote memorization. The anecdote about igneous fusion is a good example of the futility of trying to teach generalizations in which the component concepts are not understood. There were five concepts in the statement the class had "learned": *interior*, *globe*, *condition*, *igneous*, and *fusion*. Every member of the class might possibly have understood the concept *globe* in the sense in which it is used here, and probably "interior" and "condition," but certainly it would be a great deal to expect that very many members of an elementary class in geography would understand the concepts *igneous* and *fusion*. So they learned only the words, and not one child in the class could apply the generalization to the novel situation described by the visitor in simple, everyday terms. Surely the children could understand the problem as it was put to them by the visitor, for it was stated in concepts with which they were familiar. It was just that they failed to see any connection between it and the sentence they had memorized.

On the other hand, when the learner is helped to develop generalizations himself from his own experience instead of being given generalizations to memorize, empty verbalism is prevented, and the generalizations he learns will be meaningful and hence useful.

⁶In his discussion of the learning of generalizations (Chapter 7) Gagne, *op. cit.*, emphasizes the importance of continuity in learning concepts and generalizations. He points out that the structure of conceptual knowledge is hierarchical, that is, the formation of high-level generalizations depends on formation and mastery of simpler and less inclusive generalizations. He cites various experimental studies that indicate the learning of an organized body of knowledge is dependent on prerequisite lower-level generalizations.

Another well-known student of cognitive learning theory, J. S. Bruner, emphasizes the importance of a student's grasping the underlying structure of a field of knowledge. Bruner concludes that all the fields of knowledge represented in the curriculum of the school probably should be reorganized to emphasize their basic structure more clearly. See Chapter 2 of his *The Process of Education* (Cambridge, Mass.: Harvard University Press, 1960).

At the end of your task with the mibs, even if you had not formed the concept completely during the trials, you could understand the generalization that a mib was a right triangle of any size, in any position, with a short line protruding at right angles from the shortest side. You could understand it because you understood all the concepts in it—*right triangle*, *size*, *position*, and so on. But to a first-grader it would be meaningless because he would not have those concepts in his repertoire yet.

Ensuring meaning in conceptual learning

Today's teachers rely less on the kind of formal recitation that encourages rote memorization. And today's textbooks strive for directness and informality in their presentation. Children's school experiences are more varied and more inclusive. But the danger remains. Material that seems simple, clear, and meaningful to you as the teacher may be difficult and vague and devoid of meaning to your learners. You will need to be constantly on the alert for cues as to how it looks to them and what experiences *they* are having.

In secondary schools, where the amount of conceptual matter to be covered is enormous, the hazards increase.

The following are several specific precautions that can help you to avoid teaching empty words.

1. Do not try to establish too many concepts or too many generalizations. Investigators in the field have questioned for a number of years whether we do not try to teach too many concepts in school.⁷ Brownell and Hendrickson (1950) have pointed out that we cannot teach thoroughly all the concepts in school subjects because there are too many of them. Some will be learned better out of school and some have little importance anyway. We will probably do better if we restrict the number and do a better job on those. Modern textbook writers are following this line. They know that incomplete, meaningless learning is quickly forgotten, whereas concepts and generalizations carefully developed and clearly seen as related to other experiences are more apt to be retained and used.

2. Clear, useful concepts and generalizations are the product of rich and varied learning experiences. They cannot come any other way. Conversely, rote learning, exclusive reliance on printed and verbal materials, formal recitation, and stereotyped methods of appraising learning lead to empty verbalization and all the evils which attend it. Children need ample opportunity to expand, correct, and clarify their concepts and generalizations through experience with new situations. A concept "taught" in only one context may be quite inaccurate and may not be seen as relevant in a different context. A boy can recite, "The interior of the globe is in a condition of igneous fusion," and not know what the inside of the earth is like. Neither will the generalization help him in later study about the earth.

3. Individual differences apply here as elsewhere. Children come to school with all kinds and degrees of intellectual ability, from all kinds of environments, with all kinds of motives, and with varying degrees of maturity. Concept formation

⁷For an analysis of the overloading of quantitative concepts in relation to growth level in several social studies textbooks, see "Quantitative Concepts in Fifth-Grade Social Studies Textbooks," by J. Jarolimek & C. D. Foster (*Elementary School Journal*, 1959, 59, 437-442).

requires time and experience. There will be great differences among learners in their abilities to learn conceptual material, and each will have different past experiences and a different set of concepts and generalizations on which to build. Even if you find that one or two of the children in your class understand and can apply a particular generalization, you cannot assume that all, or even very many, of the rest can do so. Here, as elsewhere, trying to make everybody fit the same pattern is dangerous as well as fruitless. You must try to provide for *each* child the balance *he* needs of concrete and conceptual experiences.

LEARNING TO SOLVE PROBLEMS

One of the *ways of doing* that schools want children to learn is an efficient way of solving problems, including skills in disciplined inquiry and reasoning.

It is a commonplace that life is a constant process of readaptation to a changing environment. Yet each day is not wholly new. In your everyday living you depend greatly on previously acquired habits that are relevant for adjustment today. Without reflection, you tie your shoes, brush your teeth, comb your hair, eat your breakfast, and perform the other operations necessary to prepare for the day.

So long as no unusual conditions are present, your stock of habits is adequate to see you through. If you did not have a stock of habits or learned behavior on which to rely, your life would be a veritable nightmare. Every simple necessity to act would be a crisis. In fact, it seems doubtful that life itself, not to mention reflective thought, could exist without the structure that habit gives to existence.

What makes you think?

Thousands of times Fred has climbed into his car in the morning, turned the key, idled the motor, and started to the office. He has become so habituated to a time schedule that loss of a few minutes throws his daily program off. He does not reflect on the operation of automobiles. He has performed the acts of starting the motor, backing out of the garage, stopping at the traffic light, and so on, so many times that he has mastered the pattern thoroughly. As he starts the car and follows his usual route to the office, he can worry about a problem at the office or merely ruminate. He does not have to think about how to drive the car. His habits are smooth and coordinated.

But one morning he is proceeding on the usual schedule. He has arrived at the place in the sequence of morning events when he is to start the motor of the car. He turns the key; the starter cranks the engine. But nothing happens. The engine will not fire.

Now he is faced with a problem. His habits will not suffice to take care of this situation. He must supply something new.

What happens? He begins to think. Questions come rushing to his mind. What should I do? What is the matter with the car? Should I try to catch the bus? Could

the garage man get here quickly enough? Could I fix the car myself? Could I catch a ride with a neighbor—if so, how would I get home this evening?

Why is he thinking about such matters now, when customarily he does not at this particular time in the morning? The answer is evident. *He is thinking because he has encountered a problem he must solve.* Thought takes over where habit is insufficient. Thinking begins in the presence of a problem.

Thus by *thinking* we do not mean the stream of consciousness, nor do we mean the daydreaming and woolgathering in which all of us invest a considerable amount of time. We mean the deliberate application of reflection to the solution of a problem.

What is a problem?

A problem occurs when activity is blocked by an obstacle that cannot be removed by use of ready-made habits. The situation is unfamiliar and confusing to you; if it were clear, your habitual responses would suffice. The obstacle can be something present that must be changed or something absent that must be found. Or sometimes all the necessary factors are present, but you have to learn to see them differently. To remove the obstacle you have to think. To see how this process works, try to solve the problems given in Task 6 (p. 289).

Were there any problems that you already knew the answers to? If so, they were not problems for you because there was no obstacle. They did not make you think.

Were there any that you did not even try or gave up on after a little trying? Only as you accepted the goal as yours did the problem make you think.

Were the obstacles in your way the same as the obstacles in everyone else's way? Compare notes and see. Were the problems equally hard—or easy—for everyone in the class?

We must refine our definition. We must say: "A problem for *you* involves a goal of *yours* which *you* see as blocked by some obstacle that *your* habits cannot cope with." This is not hair-splitting. It makes a difference.

Sometimes a teacher fails to see that what he considers to be a problem is not a problem to those who are expected to solve it. Miss Blake in Chapter 2, for example, is very fond of using "problems" in arithmetic. She has several books full of them and employs them liberally in the arithmetic period. How real are these reported problems? Can they be real before somebody accepts them as problems?

Miss Blake presents another kind of problem, too. When she tells children that the assignment is to solve the ten problems on a certain page, she may add that nobody will go home until he has finished. Now she has provided the class with a real problem—real, that is, to them. Their problem is how to get out of school as soon as possible. This one they recognize for its problematic character; this one they are motivated to solve.

Here again we note that the course of action an individual elects to pursue

depends in part on what he brings with him to the situation. A child who is competent in arithmetic will see the solution as working the examples as quickly as possible, turning in his paper, and getting out. Others, less competent, follow other courses of action to solve the problem of getting out. Some may try random manipulation of figures in the problem in the hope that it will "come out right." (Children have actually been known to use the number of the example in their calculations!) Some may copy from the paper of another nearby; one may invent an excuse that his mother is waiting for him downtown and he must not be late in leaving school. There are other possibilities which you may recall from your own experience. In these ways Miss Blake's pupils may or may not improve their arithmetic skill; many of them are likely to improve in their use of devious or "detour" behavior. What you learn depends on what problems you try to solve.

Only as a problem is *identified* and *accepted* will an individual work to solve it. Many problems, especially social and emotional ones, go unsolved because people see no problem. Just as a learner's knowledge is the result of *his* experience, he will work to solve only the problems that are problems to *him*. It is idle to urge someone to "Think!" He will think, as best he can, when he is confronted with what he sees as a problem. And the problems he sees and tries to solve fashion the framework for what he learns.

Because of differences in perception and in knowledge and skills, no two people face quite the same problem even in the same problematic situation. In one sense any of us placed in Fred's situation with a stalled car would be faced with essentially the same problem—that of reaching our destination. In another sense we all would face somewhat different problems. The goal would be the same but the obstacles in our way would be different. What would be a stone wall for one person might be a door for another. If you doubt this, compare notes in class as to what several students would do about a car stalled in the driveway.

Partly, it depends on which aspect of the situation we focus on—which, in turn, depends somewhat on our past experience and what resources are available. Fred, who has had considerable experience tinkering with automobile engines, would react to the situation quite differently from his mother, for example, who does not even know how to raise a car's hood.

Fred might define his problem more specifically as reaching his goal by repairing the car. He still has a problem—he does not know what is wrong with the car—but this looks like an obstacle that he can overcome.

On the other hand, his mother would dismiss any thought of repairing the car as entirely irrelevant to the purpose at hand. She would turn her attention to other possible ways of getting downtown. She would try to remember the bus schedule. She would wonder if her neighbor might be going downtown today. She might think about calling the garage. Finally, she might decide that everything considered, it would be best to try to catch the bus.

You can solve a problem only if the obstacle between you and your goal is within your capacity to remove. A teacher who wants children to think about when to add and when to take away or how to wire a dollhouse for electricity arranges goals and obstacles in relation to his children's capacities—beyond their habits, but not too far. As Bruner (1960a) puts it, "It is easy to ask trivial questions or to lead the child to ask trivial questions. It is also easy to ask impossibly difficult questions. The trick is to find the medium questions that can be answered and that take you somewhere."

For observation

JIM'S CLASS LEARNS ABOUT PASTEURIZATION

Jim's ninth-grade science class had been working on problems suggested by their text on the subject of food, its preservation and use. One day the science teacher, Mrs. Gable, brought a bottle of milk to school, put it on a shelf, and suggested that members of the class look at it every day.

For several days they looked at the milk and smelled it periodically, making such comments as: "Smells like buttermilk." "Reminds me of yogurt." Finally, "It smells bad!" At that Mrs. Gable asked the class what had happened to the milk.

"It's sour," Jim pronounced flippantly.

"What makes you think it's sour, Jim?" Mrs. Gable asked.

"I don't think. I know," Jim replied. "And I know why, too. It wasn't pasteurized right."

The class had seen a film on bacteria a few weeks past. Jim thought pasteurization would have killed all the germs in the milk if it had been done properly. Mrs. Gable realized that the film had oversold a particular point and that bacteria had become identified with germs. She led the class into a discussion of disease and germs.

Mrs. Gable asked the class to think of reasons for the milk going sour. This was the list the class produced, starting off with Jim's explanation.

WHY MILK MAY SOUR

1. Improper pasteurization.
2. Sick cows.
3. The heat.
4. Lightning and thunderstorms.
5. Dirt in the milk, dirty bottles.
6. Germs.
7. Age. All milk sours when it gets old.
8. Because it's sweet. Fruit is sweet and it gets sour.

"Why is the problem of milk getting sour important to you?" Mrs. Gable asked.

Several boys and girls told about having milk sour at home. Everybody remembered the day when all of the milk in the cafeteria was sour. Jim reported that once he went camping and had nothing but water to drink because the milk always soured.

"We got it from a farmer who didn't pasteurize his milk. That shows that the reason milk sours is 'cause it isn't pasteurized," he declared. Without realizing it Jim had already changed his explanation. Just a few minutes ago he had said sourness was caused by improper pasteurization—now it was nonpasteurization.

"Can we test any of these explanations right now to see if they are correct?" Mrs. Gable asked, returning to the list on the board. "Or do we need more information?"

"I don't think the last reason is a very good one," Kay volunteered. "Sugar doesn't get sour. And when I eat green apples from the tree in our back yard they taste sour. But if I wait until they're ripe they taste sweet."

It was agreed that the last point was not a valid explanation and Mrs. Gable erased it.

"Can any of you prove or disprove the other points we have listed?" Mrs. Gable asked. Nobody had anything to offer.

"Jim, what do you suppose improper pasteurization includes?" she inquired. Jim wasn't sure. A few of the others made guesses, but nobody else was certain either.

"Golly, I don't even know what proper pasteurization is," Mitchell declared. "I sure wouldn't know what *improper* pasteurization is."

This seemed to be the stumbling block. The boys and girls agreed that they were not in a good position to discuss the problem at all with the information they had at present. With Mrs. Gable's help they decided they needed to know what proper pasteurization is, what it is for, and how it is done.

Several committees were formed to do research. One checked encyclopedias. Another found several books on dairying in the library. A third obtained government bulletins from the library and contacted the local county agent for other Department of Agriculture publications. Still another group obtained booklets from a national dairy organization.

Jim and Mitchell were named coordinators of the information. They did little preliminary reading themselves, but went over the material digested for them by the various committees. They organized it and checked one source against another. When there was a difference of opinion, they sat down with the committees involved and tried to find where the trouble lay. Sometimes it was a matter of inaccurate reporting. Sometimes new sources had to be consulted.

Whenever there was a barrier or progress was slow, Jim would get upset. He was ready to give up or to try something blindly without taking any precautions or thinking carefully about what needed to be done. Mrs. Gable listened to him patiently and helped him reinforce his original drive. She had little need to contribute information directly, but she did help prevent his dramatic statements from being taken at face value by suggesting other possibilities. Mitchell's steady, deliberate manner was a good counterbalance for Jim's volatility.

For the others, too, there were periods of high and low interest and times of confusion. Learning of this kind does not proceed in logical, neat steps. Mrs. Gable found many challenges to her skill and tact and ingenuity.

When their information was complete, Jim and Mitchell reported to the entire class what the various committees had learned. Jim pointed out that pasteurization kills all of the disease-bearing bacteria. However not all of the other bacteria contained in milk are killed. Some of the bacteria surviving are of the particular type that produces lactic acid, and it is lactic acid which gives a sour taste to milk.

Mitchell described two methods of pasteurization: (1) Heat milk to 60–65°C. for 20 to 30 minutes, and (2) Heat it to 80–85°C. from 30 seconds to one minute. In both cases the heating was to be done in a stoppered bottle or closed vessel and was to be followed by rapid cooling. It was stressed that the milk should not be boiled.

Now that the class had sufficient information Mrs. Gable led them into a discussion of the eight original reasons they had given for the souring of milk. It was decided that two of the points—dirt in the milk, and germs—would be a part of improper pasteurization and they were crossed off the list.

"Your report shows that the basic cause of sour milk is lactic acid," Mrs. Gable said. "Does this mean we can rule out improper pasteurization?"

Jim checked over his notes. "Well, if the milk was not heated to the right temperature this would mean that the milk would have a larger number of bacteria in it. So there would be much more bacteria to produce the lactic acid and it might sour faster."

Kay remembered that in her research she had found that milk is pasteurized in thermostatically controlled equipment. "So I don't imagine the bottle of milk Mrs. Gable brought was improperly pasteurized," she said.

It was decided that improper pasteurization could be a contributing factor to souring but it was unlikely that it happened very often.

Exposure to bacteria from the air was discussed. If the exposure took place before pasteurization, then most of the additional bacteria would be killed by pasteurization. If the exposure took place after pasteurization, the milk was likely to sour somewhat faster because a greater amount of the bacteria which produces lactic acid would be present.

"What about the next theory—the heat?" Mrs. Gable asked. Everyone agreed that heat was an important contributing factor. Jim's report had indicated that refrigeration slows up the production of lactic acid, therefore heat might increase it.

On the point of age the class concluded that lactic acid production goes on even under refrigeration so all milk would eventually turn sour.

Nobody could see how sick cows or thunderstorms could affect the production of lactic acid. They had turned up no information on either point during their research. Several of them said they thought it was just superstition.

Mrs. Gable explained that electrical storms do appear to have some effect and why. She told how this may have led to the development of an "old wives' tale."

John, who lived on a farm, was anxious to point out how important it is that the cows be healthy. He told the class how much work it was to keep the milk clean and how it was rushed to the dairy.

"From the information you have gathered, what statements can we make about the keeping qualities of milk?" Mrs. Gable asked. The class gave numerous answers which she summed up as follows:

1. Pasteurized milk should keep sweet longer than raw milk under the same conditions because pasteurization kills some of the lactic acid-producing bacteria.

2. Pasteurized milk that is refrigerated should keep sweet longer than pasteurized milk that is not refrigerated. Raw milk that is refrigerated should keep sweet longer than raw milk that is not refrigerated. The reason for this is that refrigeration slows up the production of lactic acid.

3. Milk that has been exposed to bacteria from the air will sour faster than the same quality of milk that has not been exposed, unless pasteurization follows the exposure. This happens because exposure adds more lactic acid-producing bacteria.

Mrs. Gable was careful to point out that the class had arrived at its conclusions as a logical consequence of the information that had been collected. "But these statements are really theoretical," she said. She suggested that the class try some experiments to test their statements. They responded enthusiastically.

"We will call our three statements our working hypotheses," Mrs. Gable said. She explained that a hypothesis is a theory or a "hunch," provisionally or tempo-

rarily adopted to explain certain facts and to guide in the investigation of others.

The class discussed what sort of experiments were necessary. They would have to obtain some raw milk and then pasteurize a part of it. Samples of both raw milk and pasteurized milk would be refrigerated, other samples would be placed at room temperature, and still other samples would be exposed to the air. They decided to prepare a number of samples under each condition.

John invited the class to visit his father's dairy farm to obtain a supply of raw milk. The visit took quite a bit of preparation. It had to coincide with milking time and there had to be sterile containers and ice to keep the milk cold. The trip had to be made on a Saturday.

Once at the farm the class scattered in all directions. For a while the haymow proved more interesting than milk and gave the boys an opportunity to show off to the girls. There were animals to make friends with and strange machinery to inspect. So the class ran from this to that, forgetting the milk.

Finally Mrs. Gable called the class together and John's father, Mr. Haferbecker, demonstrated the milking process. Mr. Haferbecker provided the class with two gallons of raw milk. All of this was put into iced containers immediately except for half a pint which was placed in a separate bottle and exposed to the air in the barn.

Tests were arranged to cover time factors, heat, and pasteurization by the two methods previously discussed. When it came to pasteurization there were two questions. Why the closed vessel? Why not boil the milk? As one boy said, "Boiling really ought to kill the bugs in it."

So the class set up an experiment to see what happens when milk is boiled. They heated one sample to 60°C., another to 80°C., and a third to boiling. They found that the first two samples tasted the same as before heating but the boiled milk tasted different. Many of them found it distasteful. Jim insisted on a blindfold test—"the way they do on TV"—before he was satisfied.

At the same time the class found out why it is better to have stoppered bottles and closed vessels. They used both stoppered and unstoppered bottles in the experiment and observed the scum on the open ones. Now the class could go ahead with the pasteurization.

Each sample was carefully labeled. On the third day after the pasteurization the class decided to run its first tests. One sample of each condition was checked. All of the samples that had been kept at room temperature tasted sour and reacted intensely to litmus paper, showing the presence of acid. The refrigerated samples did not taste sour and had only a slight litmus reaction.

The group attempted to use a microscope to test the samples for presence of bacteria. Some insisted they could see bacteria, others were not so sure. Even those who thought they detected bacteria could tell no difference between one sample and another.

So that the class would not reach a faulty conclusion from this, Mrs. Gable was quick to point out that the equipment they had was not precise enough for such technical observations. The equipment used in dairy laboratories was especially designed and much more powerful, she said. This led to the suggestion that the class visit a laboratory to confirm points that they were unable to check themselves.

Over the next two weeks periodic tests were run and records kept by individual observers. It was well over a week before any of the refrigerated samples

showed signs of souring. Again, because of limited equipment, the class was unable to find differences between raw and pasteurized milk. Some of the samples showed inconsistencies and this led to a question about whether some of the controls were working properly.

Jim got so interested during the project that he began to read on his own, taking notes of things he thought were important. Several others did extensive reading too. Some began to run their own samples with pasteurized milk from home. All the children became familiar with such terms as lactic acid, bacteria, and curd, terms which they enjoyed using whenever possible.

Jim continually got into the problem beyond his understanding. In frequent discussion sessions Mrs. Gable helped him and the others to clarify their thinking. She pointed out details they had not seen, relating them to reactions found in other types of fermentation about which they knew little.

Jim's understanding of pasteurization influenced his conversation at home and increased his appreciation of the values of cleanliness. He felt differently about the family milkman and the family refrigerator. His Scout refrigerator took on new meaning. He began to comprehend the biochemical world and to find an excitement in exploring his everyday world through the eyes of science.

Mrs. Gable showed Jim and the others how they could use what they had learned to understand new things in other science courses they might take later and in the work they might do. At a final discussion, the class talked over how problem solving works. They reviewed the process—the problem, the hypotheses, the tests, the controls, and the conclusions. In this case they had found that temperature, pasteurization, time, and contamination all had effects. They talked about ways to use the problem-solving method in other situations. They used a stalled automobile and studying as examples.

All in all, Jim felt he had learned a great deal from the problem that had started with a simple bottle of milk. He had also practiced leadership, participated in group work, and done some independent study.

As you think about the way in which this activity developed into a learning experience for the class, consider some of the things the teacher did to facilitate it. At the start she got the group interested in the problem. She helped the group formulate goals and occasionally had to help reinforce them as the project went along. She helped the group use information they already had in order to find new information. Without her help the children would not always have used their previous learning to best advantage.

Mrs. Gable's goal in this learning activity was not limited solely to having the students accumulate facts on pasteurization. She was also interested in having them experience first-hand the process of hypothesis and experiment, to get some idea of what is actually meant by the scientific method so they might begin to develop a habit of inquiry. And she sought to give the class the opportunity to carry on independent work, make plans, seek out information which was genuinely connected with a problem and could be applied to it, and work with others.

How do you solve problems?

Essentially, you solve a problem by removing the obstacles so you can reach your goal. First you identify the problem as specifically as you can and then you start

trying whatever you think might work. If it does not work, you try something else that seems feasible. Some obstacles may be removed purely by thinking. Some require a combination of thought, experiment, and observation. Even those solved by thought alone are usually *checked* against experience.

One of the best-known analyses of problem solving through reflective thought is that presented by John Dewey in *How We Think* (1910).⁸ Dewey has analyzed a complete act of thought, from initial recognition of the problem to the final testing of the hypothesis, into five major steps. This analysis is not intended to be descriptive of the kind of activity in which all people engage in solving problems or to represent a formula that you should follow. It is probably rare for a person to go methodically through the steps in this order. You are more apt to find that one step blends into another, that some may be omitted, that the learner may skip one step only to backtrack at a later time and use it. However, it is probable that efficient problem solving involves, in one way or another, the five steps summarized below.

1. The learner recognizes the existence of a problematic situation. His goal-directed behavior is upset by circumstances which bar him from the goal. The car will not run. The milk sours on the camping trip. He cannot get along comfortably with his parents. The bicycle tire is flat every morning for three days in a row. Regardless of what is wrong, habitual responses will not suffice to meet the situation. As we have noted, thinking begins in circumstances such as these.

2. In order to deal successfully with a problematic situation, the person involved must be able to structure the situation sufficiently to identify the problem. He must be able to analyze the situation to see what elements are relevant to the solution of the problem and, equally important, what elements are *not*. If he can do this, he can launch an attack on the problem.

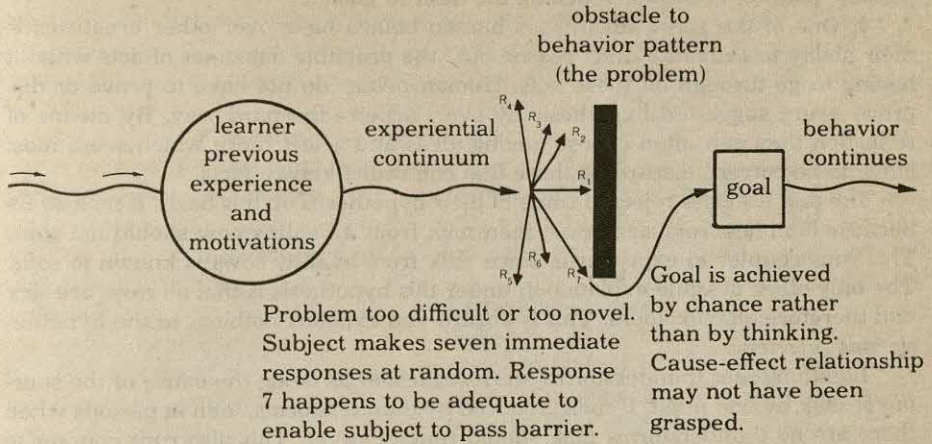
You have already seen that an individual's ability to identify a problem depends not only on such factors as general intelligence, but also on his previous experience. Placed in a situation in which his background of relevant knowledge is nonexistent or very meager, even a highly intelligent person will find himself unable to distinguish what the key factors in the situation are.

While a background of relevant knowledge is important, such knowledge does not automatically ensure ability to solve novel problems in a field. Often relevant knowledge is not recognized as being relevant. It may have been learned in another context or it may have been learned by rote, without understanding. Furthermore, learning facts and using facts to solve new problems are different processes. Successful experience with one does not necessarily equip you for the other. Some of the problems in Task 6 were difficult not because you lacked the necessary knowledge but because it had to be used in an unusual way.

If an individual cannot clarify and define the problem and the obstacles to be removed, he can use only blind trial and error. He will be unable to direct his

⁸An exposition of Dewey's theory of inquiry with practical suggestions for its use in the classroom will be found in *The Experimental Mind*, by B. B. Brown (New York: Harper & Row, 1968). Dewey's original work laid the foundation for the application of problem solving to educational method. More recent contributions include: J. S. Bruner and others, *A Study of Thinking* (New York: Wiley, 1956); J. R. Suchman, *The Elementary School Training Program in Scientific Inquiry* (Urbana, Ill.: University of Illinois Press, 1963); Robert M. Gagne, "The Learning Requirements for Enquiry" (*Journal of Research in Science Teaching*, 1963, 1, 144-153); and by the same author, "Problem Solving" in *Categories of Human Learning*, Arthur W. Melton, Ed. (New York: Academic Press, 1964).

PROBLEM SOLVING THROUGH RANDOM BEHAVIOR



behavior intelligently, because he has no structure on which to base a plan of action. If he is successful, he may not realize why. The diagram above illustrates problem solving by random behavior.

It is common knowledge among experienced teachers that reported problems can be made much more difficult for pupils by the addition of irrelevant data which trap the unwary and prevent their clarifying the problem sufficiently to plan a mode of attack. The "whodunit" does the same thing by introducing extraneous material so that the reader does not see the genuine clues.

The importance of teaching pupils to identify key factors is further underlined by an intriguing study of problems conducted by Buswell and Kersh (1956). They asked their subjects to identify three kinds of key elements (relevant facts, irrelevant facts, and needed missing information) in problems like the following:

On January 14, Mr. Smith and his son, who was 17 years old, drove to market with some sheep which they sold for 35¢ a pound. If the average weight of the sheep was 60 pounds, what was the amount of money received?

Surprisingly enough, even with such simple material as this, both high-school and college subjects identified only about half of the key factors correctly. Here is a specific skill on which successful problem solving depends, which teachers often take for granted. It seems so obvious! Surely *anyone* would see that the son's age and even his presence were irrelevant and that one would have to know how many sheep were sold in order to answer the question. Not so, according to this study.

3. The next step is to evolve hypotheses for the solution of the problem. In considering the problem of why milk sours, Jim's class proposed nine different hypotheses to account for it. Dave's class suggested several ways by which they might be able to improve their batting. Fred and his mother, in their stalled cars,

thought of several possible ways of getting downtown. These were hypotheses: possible plans of action for reaching the desired goal.

4. One of the great advantages human beings have over other creatures is their ability to elaborate and "reason out" the probable outcomes of acts without having to go through all these acts. Human beings do not have to prove or disprove every suggested hypothesis by overt action—the hard way. By means of reflection they can often choose among ideas and select those which seem most likely to be correct, discarding those that contradict known facts.

Jim and his class rejected some of their hypotheses on this basis. If milk sours because it comes from sick cows, then milk from a healthy cow should not sour. This runs counter to experience, since milk from healthy cows is known to sour. The only other possible explanation under this hypothesis is that all cows are sick and therefore all milk sours. This is absurd and explains nothing, so the hypothesis was rejected.

Lightning and thunderstorms were suggested as being the cause of the souring of milk by one pupil. If milk is soured by thunderstorms, then in periods when there are no thunderstorms milk should remain sweet. This also runs counter to known facts, for milk is known to sour at all seasons of the year, not merely in thunderstorms. Therefore, this hypothesis was rejected as insufficient. Dave's class also rejected alternatives which they realized would not work.

5. The last step in the process is to test the likeliest hypothesis by applying it to the problem situation. This may mean putting the plan into action and observing its outcome—seeing whether this hypothesis resolves the problematic situation satisfactorily.

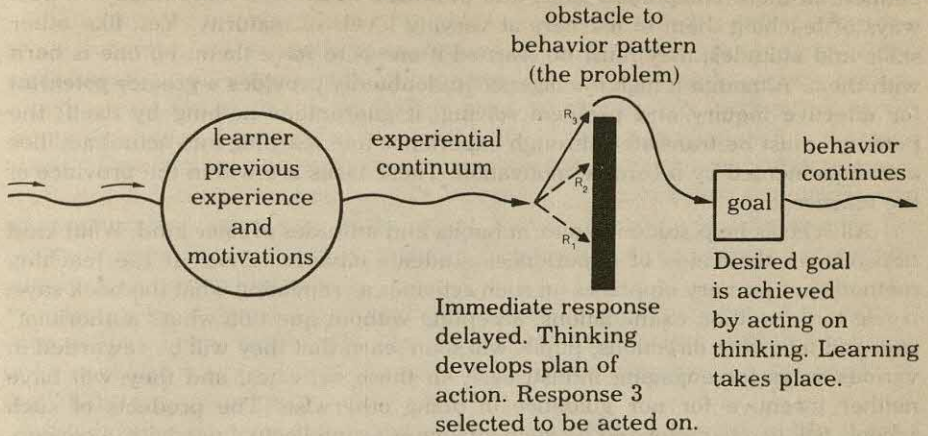
The process of problem solving in some problems primarily intellectual rather than practical or physical may involve seeing whether the hypothesis organizes and clarifies the situation, which up to this time has been disordered and confused, or it may mean comparing the hypothesis with facts already established by other inquiries, your own or someone else's. Jim's class did both—first read to get what information they could from other people's experience, then set up experiments to verify and complete what they had read. In using the problem-solving approach with younger learners, it is probably better to rely wherever possible on tests of hypotheses through actual experimentation since children, having fewer concepts to draw on, are apt to learn more efficiently through such concrete experience.

Often, as in our class examples, there is not just one hypothesis to test, but a series: hypothesis, test, further hypothesis, further test, and so on until the obstacle is removed. In Jim's case, the process continued until he understood the relationships between souring and heat, bacteria, age, pasteurization, and so on. In Fred's case, this would take place when one of his hypotheses worked—got him to the office. The diagram on the next page illustrates solving a problem by formulating and evaluating several hypotheses, testing the one that looks most promising, and surmounting the obstacle successfully.

Teaching disciplined inquiry and critical thinking

You may recall from your study of history that the development of the pattern of inquiry—hypothesis and experiment—has made possible the astonishing develop-

PROBLEM SOLVING THROUGH THINKING



ment of the natural sciences since the sixteenth century. As long as men sought knowledge of the natural world through other means, as did the Greeks, natural science as we know it today languished. The great forward strides began when the process of hypothesis and experiment was developed and used widely.

Sometimes workers in the natural sciences have disparaged the efforts of workers in the social sciences to apply principles of scientific method to their work. It has been said, for example, that sociology can never become a true science because of the impossibility of mathematical and deductive treatment of data and the lack of opportunity for highly controlled experimentation. Precision of definition and control is certainly more difficult for the social scientist, but the pattern of disciplined inquiry has proved as useful here as in the physical sciences. With such a pattern, you try to start without preconceived ideas and look to see what is really there. You make hypotheses concrete enough to be tested and then you see if the evidence supports or refutes them.

In Chapter 7 we discussed the advantages of learning through seeking instead of through only absorbing what someone else has found. We also described some current research on ways of teaching pupils to search and inquire more efficiently.⁹

At the present time the work has not gone far enough to provide evidence for broad generalizations. The task is complicated, too, by the fact that disciplined inquiry involves many component parts—asking many questions, asking relevant questions, organizing data, identifying key elements, shifting one's mental set so as to see new possibilities, formulating and testing hypotheses, challenging irrational appeals to authority, considering all the evidence, keeping an open

⁹It must be acknowledged that the available evidence in this area tends to be contradictory. Kersh (1958) found that learning was more permanent, transfer was greater, and motivation was higher when college math students were forced to work out principles for themselves instead of being given them by the instructor. Kastrinos (1961) reported similar findings in a biology course. On the other hand, Grote (1960) and Karle (1960) found no significant differences in learning between discovery methods and traditional teaching methods.

mind, drawing valid generalizations, and so on. We have not even identified and defined all these component skills and attitudes, much less discovered the best ways of teaching them to learners at varying levels of maturity. Yet, like other skills and attitudes, they must be learned if one is to have them: no one is born with them. Although a high intelligence undoubtedly provides a greater *potential* for effective inquiry and problem solving, it guarantees nothing by itself: the potential must be translated through experience and learning into actual abilities and implemented by favorable motivation. These tasks are within the province of the teacher.

All schools help students to form habits and attitudes of *some* kind. *What* kind depends on the kinds of experiences students have in school. If the teaching methods put primary emphasis on such activities as repeating what the book says, trying to do well on examinations, accepting without question what "authorities" say, and following directions, pupils will soon learn that they will be rewarded in various ways for engaging industriously in these activities, and they will have neither incentive for nor guidance in doing otherwise. The products of such schools will be characterized by such attributes as intellectual passivity, a conception of authority as the source of truth, and a lack of self-direction.

Many people are lamenting just such attributes among a majority of American students today, but not all of them understand how such attitudes are produced. Where the allegations are true, it is because pupils have learned all too well the lessons they were receiving along with the subject matter.

Even the opportunity for practice, of course, does not necessarily produce improvement in critical thinking and problem solving any more than in other skills. If there are errors, they must be identified and eliminated. Sometimes an individual can do this himself; often he needs to be taught.

Jim and his class would not have gotten far without Mrs. Gable's guidance. If she had left them to their own resources, they might have had "practice in problem solving." But they probably would not have learned *how* to solve problems. Mrs. Gable guided them and helped them see what they were doing and why, in relation both to their immediate problem and to the general process of solving problems.

What did they learn that would help them solve other problems? First they saw that quick, obvious answers are to be viewed with suspicion and tested carefully. They learned that solving a problem begins with definition of the problem and that this in itself may involve research and thought. They learned to use what they knew to set up hypotheses precise enough to be testable, then to go ahead and make the tests, watching to see what really happened. Further questions that arose were also answered by observation or relating of known facts until in the end their knowledge of the souring of milk was a meaningful, patterned whole. They saw where temperature, pasteurization, dirt, stopping, bacteria, and age all fitted in. They had experienced success through being open-minded and objective, through empirical observation and group effort. So they learned, among other things, that this was a good way to work.

Mrs. Gable helped her students look for the key factors. Often, as already noted, a problem is a problem only because the critical figure is lost in the background. You do not see exactly what is needed. Once you can identify the key factors, you are well on your way to solving the problem. The third and fourth

problems in Task 6 were good examples of this. The hardest part of solving them was identification of the key factors.

This teacher encouraged her students to keep their thinking and observations at the concrete level of specific happenings. Questions were specific, facts sought were specific, and observations made were specific. So long as we can stick to concrete realities, as in the natural sciences, we can usually work out disagreements by empirical tests. After the tests there is seldom anything left to disagree about. But often we argue about concepts instead of things, and often our concepts are inaccurate representations of reality. We can reach agreement and accurate understanding only to the extent that we can reach past the word to the reality of experience. We can then begin to build accurate concepts and eventually accurate generalizations.

Most of us generalize too readily from one or two experiences. One experience with a swarthy barber who cheats us or with a fraternity crowd that happens to be snobbish may lead us to generalize that all swarthy barbers are crooks or that all fraternity crowds are snobbish.

Such generalizations are as bad as concluding that all misfortune comes after nightfall, after an unhappy experience at night. You need to check always to see if the things you experience together belong together or just happen to be next to each other when you see them. You cannot assume that events in a sequence are causally related. You need to look more closely.

In the puzzles you worked, you found that sometimes a solution came only when you learned to look at the problem in a new way. The more flexible your approach, the more likely you will be to see the important relationships in a new situation.

Thinking, like learning, does not exist apart from an individual. The pressures he feels, the needs he is trying to meet, and the concepts and attitudes he has built up in the past will all influence his thinking.

In group problem solving at school, the class members have high emotional factors playing on the scene at all times. The social group, its texture, its mores, and its dominant members can encourage critical thinking or inhibit it. A member with useful information but a scapegoat role may, for his own self-protection, pass up the opportunity to provide needed information. Students have been known to withhold knowledge on a problem to prevent being disliked by others. Usually social relationships are more important to a child than being objective or forwarding the task at hand if a choice must be made. Such social forces in the classroom will be examined in Chapter 9.

You saw in the previous chapter that perceptions tend to become more narrow and rigid when the individual feels threatened. The best thinking usually takes place in an encouraging climate where the learner feels free to search and explore for the solution to a problem and free to entertain wild ideas and make hypotheses that may turn out to be faulty. Even temporary stress in the form of frustration or pressure can reduce flexibility in problem solving. Undoubtedly you have felt the blocking which comes in certain examinations. Your efficiency is reduced when this happens.

Studies have also suggested that the ability to tolerate unknowns, new solutions, or flexibility in a situation is rooted deeply in personality structure (Adorno et al., 1950). Given equal intelligence, those with a high degree of prejudice have

above-average difficulty in reasoning abstractly even on material unrelated to their prejudices. They tend to be stereotyped in their thinking. There seems to be a positive correlation between rigidity in solving impersonal problems and rigidity in regard to social issues. Here again you see factors a teacher must take into consideration: anxiety, prejudice, or rigidity can have quite as much effect on the level of a child's thinking and learning as can his intellectual capacity.¹⁰

If educational procedures are to be geared to developing critical thinking and responsible self-direction, certain fundamental requirements must be met. There must be emphasis on reflective thought in problem solving, more functional use of subject matter and less emphasis on memorization, less emphasis on "the one right answer," more experimentation with ideas, less following of detailed directions, and more self-planned and self-propelled inquiry. If you want to teach your students to think critically, you must first put them in many situations where they have to think—problem situations. Next, you must help them see the key factors and make it possible for them to have the experiences they need to fill in essential facts. Then, as they try to fit the parts of the puzzle together you can keep challenging imprecise terms, conclusions from insufficient evidence, and omissions or over-emphasis so that they have to keep sharpening their thinking. But it must be *their* thinking throughout. They have to experience the goal, the obstacle, the key factors, the missing parts, and the inevitability of the correct solution.

LEARNING TO USE CREATIVE POTENTIALS

Much is being said and written these days about the value of creativity and the necessity to foster it in our schools. To get a first-hand feeling for some of the forms in which creativity may show itself, turn to page 290 and perform Task 7.

Did you see anything in common between the first two parts of Task 7? Did you have more ideas in one case than the other? Guilford (1959), who has made extensive studies of intellectual processes, has found that a person may be much more fluent with one type of material than with another.

What were the common elements in the next two parts, and what were the differences? What differences can you identify between the two activities you remembered as creative and other activities you would describe as *not* creative? How would you define an *uncreative* activity or experience?

What is creativity?

Creativity has been defined as seeing or expressing new relationships. Thus creativity is possible in thinking, in modes of social interaction, or in studying,

¹⁰Much of the original research on the significance of these factors was done in the late 1940's and the 50's. T. W. Adorno, Else Frenkel-Brunswik, D. J. Levinson, and R. N. Sanford, *The Authoritarian Personality* (New York: Harper & Row, 1950) is a basic work as is R. Christie and M. Jahoda (Eds.), *Studies in the Scope and Method of the Authoritarian Personality* (New York: Free Press, 1954). More recent experimental studies continue to throw light on the relationship of personality traits to learning behavior. See, for example, Howard J. Ehrlich, "Dogmatism and Learning" (*Journal of Abnormal and Social Psychology*, 1961, 62, 148–149); O. J. Harvey, "Authoritarianism and Conceptual Functioning in Varied Conditions" (*Journal of Personality*, 1963, 31, 462–470); Paul Heist and others, "Personality and Scholarship" (*Science*, 1961, 133, 362–367).

working, or playing. In almost everything you do you can shift old relationships into new arrangements, add new touches to old forms, and introduce new forms. You can read creatively, even remember creatively. Every time you solve a problem, you are being creative. In fact, by definition, you cannot solve a problem without being creative. Where habits will not work, you have to add something new.¹¹

It becomes obvious that creativity is not confined to geniuses. Few of us have the originality of Da Vinci, but we all have new ideas and insights from time to time and vary our ways of doing things. Every idea or expression that is original for the creator is an example of creativity no matter how many times others may have had a similar idea or made a similar expression.

Creative learning is not the memorizing of a set response but the active investigation of new ideas or problems to determine their unique characteristics and requirements. Thus it means learning to appraise and deal with new situations on the basis of their unique characteristics and requirements.

Predicting and measuring creativity

A great deal of effort has gone into attempts to identify the genesis of the drive toward creativity and the conditions that seem to induce or block it. Interestingly enough, two opposite theories have been proposed. One sees creativity as a consequence of conflict. From this point of view, issuing mainly from Freudian theory, creativity is an outcropping of inner turmoil. Certainly many of the great creative geniuses have had histories of family conflict and personal struggle, and often they have shown evidence of significant maladjustment. Some maladjusted people today who have creative talent are afraid to have therapy lest resolving their problems would lessen their productivity. Of course, the theory does not also claim the converse—that all children would be made creative by being exposed to conditions of conflict and turmoil.

The other theory is that creativity is the product of a resolved, conflict-free, mature self. Maslow's (1950) studies of self-actualizing people support this point of view, as do the many studies showing that fear and threat produce rigidity whereas self-confidence and freedom from threat make flexibility possible.

It seems more than likely that creativity is not a simple phenomenon but rather is the product of many diverse generating forces and conditions and that no single sequence of stimulants would be found in every case. There is evidence that many conditions can foster creativity and that many others can inhibit it, and the degree to which an individual is creative probably depends on the balance of the two sets of conditions in his own case.

Several investigators have pointed out that creativity is not the same thing as intelligence. There is a positive correlation between the two, but it is low—in one study + .22 to + .32, depending on the intelligence test used (Torrance, 1960).¹² The

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highly creative person is usually above average in intelligence but not always, whereas there are a great many individuals with high IQ's who rate low on measures of creativity. In fact, it is estimated that when only an intelligence test is used for identifying gifted children, about 70 per cent of the upper fifth on creativity are missed. Getzels and Jackson (1960) have found that creative children, as compared with high IQ uncreative children, tend to be more independent, more imaginative, less conforming, less respectful of authority, and, interestingly enough, less liked by their teachers. Barron (1958), who has made extensive studies of creative people, lists the following characteristics as typical of them: (1) ability to keep many ideas in focus at a time; (2) independence of judgment; (3) preference for complex phenomena; (4) self-assertiveness; (5) ability to integrate diverse elements; (6) a high energy level; and (7) what might be termed "having more unconscious material readily available." This last condition refers to a lack of inhibition and a freedom of fantasy with rich and varied associations. The creative person, in response to a given stimulus, seems to have available more and better responses from which to select—at least in his area of creativity. This last point is important. A person highly creative in one area may be quite uncreative in another.¹³ Some of the tests Barron has used are shown on page 263.

Guilford (1959), through factor analysis, has identified five distinct intellectual operations: (1) cognition (discovery, rediscovery, or recognition); (2) memory (retaining what one has become aware of); (3) divergent thinking (going beyond the given information to imagine new elements or arrangements or a variety of possible answers); (4) convergent thinking (finding the one right answer, as in drawing conclusions from data); and (5) evaluation (reaching decisions concerning goodness, correctness, or adequacy). Any or all of these might be used in the creation of new ideas or new forms, but the one that seems most central to creativity is divergent thinking, which by definition is going beyond the given elements and relationships to the conception of new ones—perhaps by analogy or elaboration, perhaps by a jump of imagination, perhaps by random trial of new forms. A great talent for divergent thinking without a corresponding ability for evaluation might be expected to lead to the instability that we have seen in some creative geniuses. In any case, Guilford's formulation has given other researchers a useful tool, for he has devised tests to show whether or not divergent thinking is taking place. Several of the studies of creativity now in process are exploring ways of fostering divergent thinking specifically.

In terms of our present knowledge, the measurement of creativity is an exceedingly tricky business. We have already seen that the correlation between measures on intelligence tests and measures on tests of creativity, while positive, are low. But if current tests of creativity do not measure intelligence, at least as it is commonly conceived, what do they measure? It is at this point that the problem of definition becomes crucial. "Creativity" and "divergent thinking" are global concepts. In order to devise an instrument for assessing them, it is necessary for

¹³Additional findings on the traits typical of creative people and some of the tests used in studying creativity are described in "The Psychology of Imagination," by F. Barron (*Scientific American*, 1958, 199, 2-9). A summary of different views on the sources of creativity is given by N. R. and M. L. Haimowitz in "What Makes Them Creative?" (In N. R. and M. L. Haimowitz, Eds., *Human Development*. New York: Crowell, 1960). A comprehensive annotated bibliography will be found in *Creativity and the Individual*, by Morris I. Stein and Shirley J. Heinze (New York: Free Press, 1960).

		
COMMON RESPONSES 1. Smudges 2. Dark clouds UNCOMMON RESPONSES 1. Magnetized iron filings 2. A small boy and his mother hurrying along on a dark windy day, trying to get home before it rains.	COMMON RESPONSES 1. An ape 2. Modern painting of a gorilla UNCOMMON RESPONSES 1. A baboon looking at itself in a hand mirror 2. Rodin's "The Thinker" shouting eureka	COMMON RESPONSES 1. An African voodoo dancer 2. A cactus plant UNCOMMON RESPONSES 1. Mexican in sombrero running up a long hill to escape from rain clouds 2. A word written in Chinese

When subjects are asked what they see in the inkblots above, the responses can be classified as common (uncreative) or uncommon (creative). The creative response to disorder is typically "to find an elegant new order more satisfying than any that could be evoked by a simpler configuration." A stimulus image of the sound of a foghorn evokes common responses like "a belch" or "a frog's croak" and uncommon responses such as "the cry of despair of a great unseen animal" or "a public address system announcing disaster."

the global concept to be broken down into subfactors that can be defined operationally.

So far, unfortunately, there have been low correlations both among the various creativity tests that have been developed and among the subfactors within a given test. For example, Thorndike (1963b) has pointed out that "fluency" and "originality," which presumably are subfactors of general creativity, do not seem to be related to each other significantly, and neither of them shows much overlap with another subfactor, "flexibility." All of which raises the question of whether such alleged subfactors really constitute a common core that can be identified as *creativity* in the global sense.

These matters are pointed out here not to disparage the importance of creativity as an important component of learning, but to suggest that work in this area is still in the stage of developmental research and the results we now have should be used with caution, particularly at the practical level of school policy and teaching.

Thorndike sums the situation in this fashion:

The extension of our appraisal instruments to aspects of divergent and productive thinking is an exciting and promising field for investigation. However, this field needs a good deal more of basic inquiry before the structure of its domain will be clear to us, or the practical utility of different types of divergent thinking measures will be determined. In the meantime, we will be well advised to use with a great deal of tentativeness the term "creativity" as applied to any or all of the tests, or "creative" as applied to children selected on the basis of them.
(1963, p. 424)

Can creativity be taught?

Some people question the importance of a teacher in inducing creativity and even wonder whether one person can make another more creative, but there is a growing body of evidence attesting to the vital role a teacher can play in this regard. In one study two hundred scientists were interviewed and the childhood histories of fourteen hundred great men and women were examined. Repeatedly there were reports of the influence of teachers—not just any teacher, but a particular outstanding teacher (Haimowitz and Haimowitz, 1960).

In a study of the attributes of teachers and classroom climates and their effect on flexibility and originality, Spaulding (1963) found two teacher styles that were negatively related to flexibility and originality. In one, the teacher responded to the emotional and social behavior of the students instead of to their intellectual performance. In the other, the teacher set up a highly formal group instruction program in which much use was made of shame, ridicule, and teacher admonition to maintain order and control.

Whether group participation stimulates creativity or hinders it is a moot question. Some have held that several people thinking together can step up the production of new ideas because they stimulate each other (Osborn, 1953).

Other investigators have reached contradictory findings on the group as a stimulator. Some studies have found that group participation fosters higher creative production; in others, the reverse occurs. Probably this variation only reflects the fact that the task, the pupils, pressures from classmates toward or away from being creative, the leadership methods, and other factors are all as important as the single variable of working alone or working in a group. Groups can provide stimulation and encouragement, as Osborn has maintained, or they can threaten ridicule or demand conformity and thus be a restricting influence.

From pilot projects and various studies of the conditions surrounding creativity, we seem safe in concluding that a teacher probably can increase creativity in pupils in the following ways:

1. *Creating an encouraging climate.* To entertain novel ideas or try expressing himself in new ways, a child needs to feel safe in doing so. He needs to feel that he is accepted and appreciated and that he can ask questions, mention half-thought-out notions, or suggest even wild and heretical ideas without being judged and censured. Many children do not dare incorporate their imaginative, inner

thoughts in their assigned work for fear that the teacher may be critical or—even worse—may read their creation to the whole class. Such a horrible possibility leads them to hew to the safer line of staying with prosaic and trite content.

It is well known that the strongly repressed child is defective in expression. He does not feel free enough—safe enough—to admit and express his impulses. Where the early experience of the child has been unfavorable, the school can do much to revive creativity by providing opportunities for exploration in an accepting atmosphere where the child can feel free to be himself.

Paradoxically, an exhortation to “be clever” may be as paralyzing to creativity as insistence on uniformity. If the task is a hard one and the individual doubts his ability to be original, he often becomes tense and rigid and “can’t think of a thing.”

2. *Placing value on variety.* Did you put more elaborate embellishments on the second figure in Task 7 than you did on the first? If so, it may have been partly because a premium was being placed on this kind of performance. Originality and cleverness were being extolled and examples were provided of responses regarded as original and clever.

The child in the classroom responds in the same way in trying to produce the kind of performance that he sees is being valued and approved. Where uniformity and the following of established patterns are rewarded instead of variety and originality, students will soon learn that it is safer and more profitable to conform. Where the teacher demands the one right answer, students have no incentive to ponder the meanings and implications of what they are studying and introduce their own judgments and evaluations into their learning. Imposing adult standards, models, or images on the student creates the impression that these are the perfect prototypes to which he should aspire. Such teaching causes tension and discouragement and discourages originality and initiative. On the other hand, when differences of opinion and expression are valued and students are encouraged to evaluate and interpret rather than merely learn and recall, they expect differences and are not afraid to be different.

Both teacher and classmates must value and give approval for originality and heterogeneity if creativity is to be encouraged. As we have seen, a group can either stimulate or restrict individual originality, and some groups are more ready than others to learn to tolerate differences among their members. If members can be made to feel that their own status is not threatened by one member’s deviation from the average, they can often be helped to establish an explicit standard which rates honesty and integrity higher than conformity. A teacher should try to avoid putting pupils in a position where they must choose between being creative and being approved by their friends.

The problem of trying to foster creativity and at the same time conform to certain standards for achievement is a very real one. American education has been criticized for thwarting creativity by its insistence on conformity. Certainly in an institution dealing with large masses of children, some uniformity of standards and practices is necessary, but if uniformity becomes a goal in itself or is pressed in all areas, children will be penalized for originality instead of being either taught how to be more creative or induced to try to be.

3. *Encouraging creative perceiving.* To be creative in expression, one must be creative in looking and listening. The creative person, besides receiving and

registering impressions, actively scans the field, examines, analyzes, interprets, evaluates key elements, toys with different arrangements, visualizes changes in given parts. Probably everyone does a certain amount of this sort of thing. Helson (1959) tells us that even the simplest perception involves some *selection* on the part of the organism and that there is always some degree of *seeking* or *avoiding*. But there is a wide range in the amount of this sort of activity. The creative person is both more active than most and more flexible than most. Undoubtedly, both the amount of the activity and the flexibility of it can be fostered or inhibited by teaching.

It is a routine thing to find an individual unconsciously screening or distorting incoming information to accord with his beliefs and values or unknowingly adding to an incomplete memory to make it seem more complete and reasonable. These, too, are examples of creativity, for they involve changing or adding to what is given. But they show the need for creativity to be accompanied by the attitude of objectivity and the skills of disciplined inquiry discussed earlier in this chapter.

4. *Teaching productive thinking and evaluation.* Activities can be structured so as to induce more productive thinking and evaluation. Teachers sometimes fail to realize that whatever the content, they can call for different intellectual operations by asking different kinds of questions. For example, if the book says that Lincoln's death made reconciliation with the South more unlikely, the teacher may test pupils' *memory* of this fact by asking them to restate it or identify it from among several alternatives on a multiple-choice test. He may call for *convergent thinking* by asking pupils to go beyond the facts given to draw conclusions or point out implications. He might call for *divergent thinking* by asking what might have been some of the consequences if Lincoln had *not* been assassinated. He could call for *evaluative thinking* by asking whether the South was better or worse off for Lincoln's death (Gallagher, 1960).

5. *Encouraging self-trust.* Extensive studies of the factors that foster or restrict creative thinking in the early school years have been undertaken at the University of Minnesota.¹⁴ These studies have indicated that the following factors discourage creativity (Torrance, 1960):

- a) Premature attempts to eliminate fantasy
- b) Restrictions on manipulateness and curiosity
- c) Overemphasis on prevention of errors
- d) Factors resulting in fear and timidity, especially pressures from age-mates
- e) Adult emphasis on verbal skills, especially on mechanics
- f) Lack of resources for working out ideas

Except for the last, all of these factors would have the effect of discouraging a child's confidence in his own ideas and impulses. Reports of these studies emphasize the importance of encouraging pupils' confidence in and respect for their own ideas and recommend deliberate effort to reduce the awe of "masterpieces" that too often leads to uncritical acceptance of something acclaimed as "great" instead of an honest, sensitive reaction to it.

¹⁴These studies are described in *Rewarding Creative Behavior*, by E. P. Torrance (Englewood Cliffs, N.J.: Prentice-Hall, 1965).

6. Children—like the rest of us—tend to behave in the ways which prove most rewarding. Torrance (1965) suggests six principles for rewarding creative behavior in the classroom:

- a) Be respectful of children's questions.
- b) Be respectful of imaginative and unusual ideas.
- c) Show pupils that their ideas have value.
- d) Give opportunities for practice of experimentation without evaluation.
- e) Encourage and evaluate self-initiated learning.
- f) Tie in evaluations with causes and consequences.

7. *Being a creative person oneself.* The teacher who varies his own routines and is constantly surprising his students with a new approach is putting an unspoken premium on creativity and gearing student appreciation to novelty. The teacher who is himself still wondering and learning and still intrigued by trying to unravel the unknowns in his subject field gives students a creative model to follow. At the other extreme, the one who no longer has any feeling of curiosity or outreach and is most comfortable doing the same old things the same old ways will at best fail to help students use their creative potentials and at worst discourage and punish creativity. There is truth in the old axiom that what a teacher *does* speaks more loudly than what he *says*.

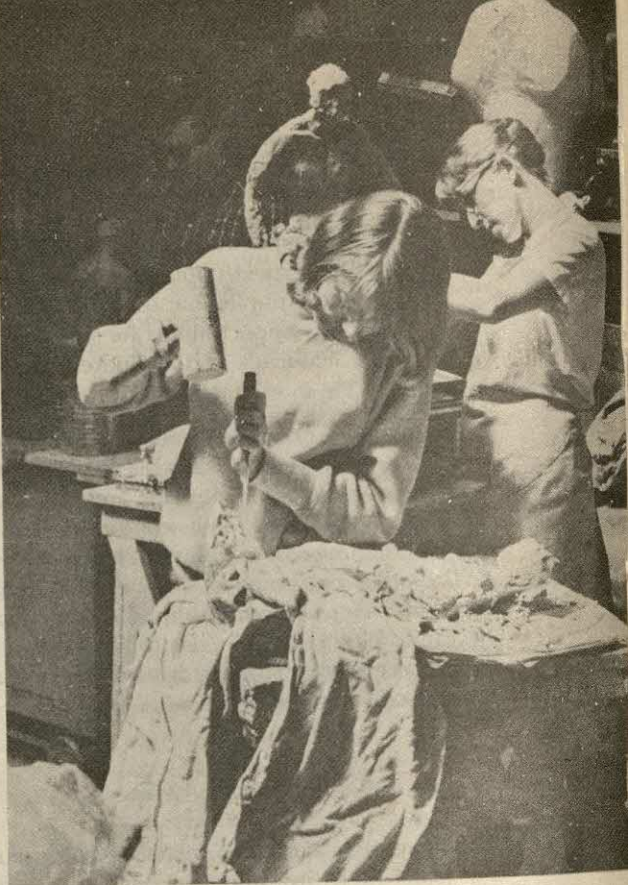
Creative expression through the arts

Imagination is easier to foster in some curriculum areas than others. Because the arts—both fine and practical arts—lend themselves so naturally to the encouragement of creative interpretation and expression, there is some danger of encouraging creativity here and feeling that the school's responsibility has been discharged. But creativity is needed fully as much in all the other areas of the curriculum.

A young child's artistic expressions are, of course, bound up in his overall behavior. He sees, reaches, touches, feels. Then he manipulates. If he feels that he is free to explore, this expressive sequence gives him the beginning of the confidence he needs later as he begins his primitive artistic explorations.

Rhoda Kellogg, who has analyzed over a million drawings made by children around the world, has found that children everywhere go through the same stages in their artistic development (Kellogg and O'Dell, 1967). At about two years of age the child begins to scribble—on paper or anything else that is handy. From this stage he moves on to shapes, first implied, then outlined. These shapes are then combined into structured forms and finally, between the ages of four and five, the young artist arrives at the pictorial stage, where his productions first become recognizable by adults. It is at this stage, Miss Kellogg warns, that overeager adults can stifle the child's creativity and kill his interest by insisting that his drawings should be accurate reproductions of what things "really look like" rather than encouraging him to give free rein to imagination and the creative impulse.

Schools can encourage creativity in artistic expression by providing materials, space, time, and plenty of freedom to explore. Children who have not used wood



A youngster's artistic talents and interests are as much a part of him as his intellectual abilities, and the school cannot afford to neglect them. Even if a school cannot provide elaborate facilities for exploring the various media, teachers can create an atmosphere in which artistic expression and experimentation can flourish—and students can be encouraged to make use of facilities offered by fine arts centers or other organizations in the community.

except to sit on will need to get the feel of wood. Plastic media require handling, touching, and forming first without regard to what is produced. Some children will be slow and hesitant and will need much encouragement to arrive at a state of personal freedom which allows them to create.

In the graphic arts, the students need to explore space and color as well as design. Their efforts may not net them a place among the American primitives but this is not important. The same is true of rhythm, dance, dramatics, and other artistic expressive areas.

Dewey observed that the best of art is bound up in life experiences. For instance, a dress in home economics can be a creative work of art. Food preparation both in class and outside is a place for functional art. Games offer an opportunity for expression. The gym has to be decorated for the dance. Posters are just posters for most of us; for some they are chances for creativity. Designing and making the scenery for a play can be as good a channel for creative expression as the play itself. The school newspaper can provide a means of expression for those with literary interest.

The teacher's job is to stimulate the pupil in his efforts to find a suitable means of artistic expression. By suggesting ways the student can project himself, rather than prescribing the form or content of projection, the teacher preserves the essential qualities of creativity: originality and individuality. It has been found that artistic creativity, like other kinds, is generally stimulated by a group situation in which originality and individuality are prized.

When a product is judged by *public* standards rather than *personal* standards, personal critical growth is inhibited. The teacher can help by encouraging realistic and constructive self-appraisal, although with adolescents he must be aware that self-criticism is likely to be unrealistically exacting, even to the point where creativity is stifled.

Lowenfeld (1957) has found that the growth of the ability to criticize one's own productions follows a normal developmental sequence. Self-criticism first appears at preadolescence and becomes acute in adolescence. The adolescent is likely to insist upon standards that he cannot reach. His creative drive becomes a matter of pleasing the judge (himself or some other) rather than expressing something that is within. To be creative at this stage is to expose oneself to others, and the highly sensitive person does not feel free to do this.

As the pupil grows in self-criticism, it is important to foster his technical skills. He becomes ready for theory and technique. Help in increasing the skill of expression should be given as the child becomes ready for it. While the urge to create cannot be suppressed when it is very strong, it can hit a plateau at a low level unless teachers are ready to provide encouragement and help. Technical knowledge can never take the place of imagination, but the creator needs to improve his work continually. Technical skills should be thought of as aids in the process of expression, not as the essence of it.

The most important thing here, as in other areas of the curriculum, is to keep alive and strong the *effort* to be creative. This means making available to pupils the physical and psychological tools they need and encouraging imagination and originality rather than insisting on the following of prearranged forms.¹⁵

LEARNING ATTITUDES AND VALUES

Attitudes, values, ideals—it is these that determine the directions in which we strive and the use we make of what we know and can do. They determine the character of our motive power. Whether we are cooperative or uncooperative, tolerant or intolerant, self-confident or fearful, magnanimous or petty depends not on what we know but on how we feel—toward ourselves, toward others, toward our world. It depends on what we see as important and valuable. Thus for a democracy, as for a dictatorship, attitude learning is the most important kind of learning the schools foster.

¹⁵For additional studies of creativity, see the following: David P. Ausubel, "Creativity, General Creative Abilities, and the Creative Individual" (*Psychology in the Schools*, 1964, 1(4)); Sarnoff Mednick, "The Associative Basis of the Creative Process" (*Psychological Review*, 1962, 69, 220-232); Donald W. MacKinnon, "The Nature and Nurture of Creative Talent" (*American Psychologist*, 1962, 17, 484-495); E. Paul Torrance, "Priming Creative Thinking in the Primary Grades" (*Elementary School Journal*, 1961, 62, 34-41).

A great deal of the school's work is directly related to developing attitudes and values. We want children to learn a reasonable attitude toward their fellow men, a respect for the democratic way of life, appreciation of the fine arts, and the like.

Children will learn attitudes and values of some sort at school whether or not the teacher is trying specifically to teach them, for any learning experience, as you have seen, involves feelings as well as ideas. The disconcerting thing is that sometimes the attitudes children learn are unhealthy ones. Can a teacher see to it that the attitudes learned will be healthy?

One of the biggest stumbling blocks in the overall work of the teacher is the generally indifferent attitude toward school held by so many children, often derived in turn from their parents' lack of interest. In meeting this problem, it is sometimes a temptation to try to make children ashamed of such attitudes or to convince them they are wrong. But people do not learn to want a thing by being told that they should want it or by being made ashamed. In attitude learning, as in other learning, some processes are more appropriate than others. Some processes are inappropriate and futile; some actually prevent the desired learning outcomes.

Attitudes are emotionally toned ideas directed toward or against something. For attitudinal learning to take place, feelings must be aroused during the learning. This seems obvious but is ignored by teachers who think children will learn respect for the flag by repeating the pledge of allegiance every morning or develop a favorable attitude toward cleanliness by going through a health inspection every day. The appropriate emotions must be aroused during the experience, or the desired learning will not take place.

Often we say one thing and do another. Verbally we decry racial prejudice but we might not want to room with a person of another race. Because our attitudes are so deeply rooted in unconscious personality patterns, we often do not know what our real attitudes are. Our behavior may reveal them more accurately than what we say, or think we feel.

All this complicates the job of the teacher both in teaching a new attitude and in deciding whether it has *really* been learned. Here, as in other learning, the test is change of behavior—new behavior different from previous behavior in a similar situation. And again, the same key considerations can guide the teacher: a purely verbal experience will probably yield purely verbal learning. The broader and deeper the personal involvement, the broader and deeper the activity and experience, the broader and deeper the learning that can come out of it.¹⁶

Do you remember how you developed your present attitude toward sports? Toward drinking? Have you always held the same general attitudes in these two areas? Since you came to college, have your attitudes become stronger or weaker or contrary to what they were? Try to analyze why you have come to feel as you do.

Are your attitudes based on facts, on what you know about sports and about drinking? Have they been affected by your relationships with other people? In general, are your attitudes similar to those of your best friends? Have your

¹⁶Role playing, by helping one to feel another's point of view through acting his part, is a potent tool for changing attitudes. See *Role Playing Methods in the Classroom*, by M. Chesler and R. Fox (Chicago: Science Research Associates, 1966).

attitudes been influenced by pleasant or unpleasant experiences you have had? If you can answer these questions you will get important clues about how attitudes develop and also some of the difficulties a teacher faces when he sets out to develop an attitude or change one that students already have.

Where does knowledge fit in?

Much of our teaching has a dual purpose: to build both understanding and appreciation. We study the German language partly as a key to appreciating German culture. Successful study of the sciences can produce a favorable attitude toward a problem-solving approach to life. A trip to the coal mine stimulates new attitudes toward those who mine the coal. Knowledge of the scientific facts of physiology, anthropology, and history can play an important part in our attitudes toward other peoples and races.

"Long after they have forgotten the poem I am making them memorize," fancies the teacher, "they will be loving poetry, in spite of themselves." There is no question that knowledge has a function. In the first place it can make the exact nature of the situation more visible, whether this be the intricacies of a Bach fugue or the lives of the coal miners. This sharpening of perception and fostering of imagination may in itself be sufficient to arouse new feelings about the Bach fugue or the coal miners. But unless feelings are aroused, the knowledge will not create or change an attitude. A person may have a general attitude that becomes differentiated and directed toward a specific target through knowledge. Although the motivating power of attitudes does not lie in facts, learning new facts can give rise to new feelings.¹⁷

Some research suggests that the better educated a person is, the less rigid his behavior and attitudes are likely to be. However, we cannot be sure whether this relationship exists because information makes a person less rigid, or because the less rigid person keeps seeking information and revising his convictions. (Hovland and Mandel, 1952). There is also, however, evidence that one can be too persuasive. One who can be easily influenced to change his attitudes on all topics is often a timid person who suffers from feelings of inferiority (Janis et al., 1959).

Acquiring attitudes through identification

Clinical work with emotionally disturbed people has shown us that much of our deepest emotional learning takes place through the process of identification. As we identify with a parent, we take over, ready-made, many of his or her attitudes and values. As we identify with a courageous hero in a story we stand a little straighter ourselves. The eight-year-old boy may identify with Batman, the fifteen-year-old girl with a screen star, the frustrated housewife with the heroine

¹⁷For a discussion of the relation between the cognitive (knowing) and affective (feeling) domains, see Chapter 4 of David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook II: Affective Domain* (New York: David McKay, 1964).

of a TV play. All of us have been strongly influenced in our emotional learning by those we have greatly admired and wanted to be like.

We all have group identifications too. The closer our feeling of belonging in a group, the more likely we are to share the attitudes and values of the other group members (Crane, 1955). The stronger the "we" feeling, the broader are the areas of agreement and the smaller the areas of disagreement. Of course, this relationship works both ways: we tend to feel close to people we agree with, but we also tend to agree with people we feel close to.

When a student respects and admires his teacher, he learns far more from him than subject matter. He tends to take on the teacher's attitudes as well. By the same token, if he dislikes the teacher, he will be unlikely to learn to appreciate anything the teacher appreciates.

Sometimes emotional learning from parent or teacher seems greatest at moments when no teaching was intended. Incidental comments made in informal situations can have more impact than formally structured teaching. Harris (1950) attributes this to the fact that the relationships established in such moments are of a more personal nature and therefore more emotionally relevant to the child.

More recent experimental work has demonstrated how important social models can be in the formation of behavior patterns. Depending on the nature of the model presented, young children can learn aggressive or nonaggressive patterns of behavior (Bandura, Ross, and Ross, 1961). It is interesting to note that the model need not even be a flesh-and-blood person. Bandura, Ross, and Ross (1963b) have shown that models presented on motion picture film, whether they are films of actual persons or cartoon characters, can be as effective in transmitting aggressive patterns of behavior as models who are actually present.

An important hypothesis, for which evidence is still incomplete, is that degree of identification with and imitation of a model can be a function of the "nurturant" role of the model. Parents and teachers ordinarily play "nurturant" roles in the lives of children. That is, they are protective and helpful, supplying psychological and material support. Bandura and Huston (1961) were able to show that in the case of preschool children members of a group to whom the model behaved "nurturantly" imitated the model's behavior more frequently than did those in another group toward which the model behaved coolly. People in the child's environment who have primary control over rewards and punishments also seem to be powerful figures for identification (Mussen and Distler, 1959; Bandura, Ross, and Ross, 1963a).

Various theoretical explanations for the phenomenon of identification have been offered by psychologists, but none of these has received complete acceptance. The first objects of identification in the child's life are, of course, his parents. Freudian theory explains identification in terms of the child's fear of his parent of the same sex: boys fear their fathers and girls their mothers. The root of this fear is the unconscious desire for sexual relations with the parent of opposite sex. As a way of coping with this *Oedipal conflict*, as Freud called it, the child identifies with the parent of the same sex, imitating his behavior and adopting his values. In this way, or so it is held, identification is a means of reducing anxiety.

Another explanation, based on the anxiety-reduction theory of identification, goes something like this: a basic source of anxiety in the young child is that he will lose the love of his parents. He has established strong emotional ties with his

parents and in order to maintain these ties and avoid loss of love and protection, he seeks to become as much like his parents as he can (Bronfenbrenner, 1960).

Yet another explanation is based on the finding, cited above, that the model's power to reward or punish is frequently a major factor in identification. Thus a child, sensing the gap between his own power to master events and gain pleasure and that of a parent, may increase his own sense of power by identifying with the parent.

Although there is still much to be learned about identification as a means of attitude formation, we know enough already to say that it is an extremely important force in the socialization of the child. This points up the importance of something we discussed in earlier chapters, namely the crucial need of the child for suitable figures with whom he can identify. If you think back to the accounts of Joe and Jerome in Chapter 4, you can see that one of the great advantages Joe enjoyed was the presence in his life of suitable models for identification, while one of the most unfortunate aspects of Jerome's life was the absence of such figures. Many of the differences in the attitudes of these two boys can be traced to this basic difference in their environments.

Acquiring attitudes through association

Sometimes attitudes directed toward one object are transferred to a new object by association. We read in Chapter 6 of the way J. B. Watson conditioned a small boy to fear a rat by presenting a frightening noise when the child touched it. Mary Cover Jones (1924) conducted a similar experiment in which a boy was conditioned to fear a rabbit. She continued the experiment, however, to reestablish a favorable attitude toward the animal. To do this, she had the rabbit brought into the room when the boy was eating, thus associating the rabbit with a pleasurable experience. As long as the animal was not the most potent stimulus but was in the background, the boy could go on eating. Gradually he was able to tolerate closer and closer contact with the rabbit until he was finally able to touch it while enjoying his food. Thus a pleasurable attitude toward the rabbit became his new "learned" response.

For the teacher, this experiment demonstrates that present attitudes can often be used as bridges to new ones. Attitudes already held will automatically affect new learning and can often be incorporated into the new learning situation deliberately in the building of desired new attitudes. For example, in a classroom where pupils have no particular attitude toward music and the teacher wants them to enjoy a musical experience, he may build positive, interesting, meaningful images in preparation for the musical experience itself. If he sets a tone of pleasing excitement and anticipation, the new experience will have pleasant associations.

On the other hand, if he creates an atmosphere of fear and anxiety by insistence on prompt and flawless identification of title, composer, nationality, and musical form, most pupils will develop negative attitudes toward the musical experience even before the selection has been actually encountered. They will not learn to love music by being tested on recognition of thirty selections any more than they will learn to love poetry by being forced to memorize it. Their experience with music must have enjoyment and satisfaction in it if they are to learn to appreciate it.

Learning attitudes by association is limited, however, if it consists only in attaching old responses to new objects. To have much meaning, your attitude toward music or taxicabs or formal dinner parties or anything else should go beyond such associations to include outcomes of direct experiences with the particular object. Meaningful attitudes are more than just "for" or "against." They are highly particularized.

There is also danger in learning attitudes through association for, like the small boys in the experiments discussed above, the learner may not look to see if the new object really deserves the same response as the old one. This is the time-tested method of the propagandists, who want people to accept or reject ideas without thinking. It is conditioning—unthinking association of old reactions with new objects. Things may be presented as equivalent which are not equivalent at all. A citizen of a democracy needs to keep checking on his attitudes to be sure they are relevant and appropriate to the particular situation.

Values: A special case of attitude learning

Values are the attitudes an individual or a society holds with respect to worth or desirability. If any society, primitive or complex, is to remain stable, each generation must in some way transmit to the young the values it regards as valid and important. We have learned from anthropologists that no human culture is ever completely stable. Some changes are always taking place and therefore cultural stability is a relative matter. But in a society in which the rate of change is slow, a common core of values exists. These values are widely accepted in the society and widely understood. Moral norms are clearly delineated and, though it is the responsibility of the individual to make his own specific judgments of right and wrong, the rules are clear and usually offer him dependable guidance for making decisions. At the same time, they enable him to expect consistent judgments of his behavior by others. Besides this common core of values, there are matters on which the individual is free to choose for himself (Linton, 1936). In our society, for example, the drinking of alcoholic beverages is a matter of choice.

When social change accelerates, the core of values becomes indistinct. It is not easy for an individual to perceive with clarity which values are universal and binding on all men and which are peripheral and open to individual choice. The allegiances of individuals are pushed and pulled hither and yon and the result is ethical confusion that eventually may lead to social chaos. To say that the moral education of the younger generation is difficult under such circumstances is to belabor the obvious.¹⁸

To illustrate some common conflicts and contradictions in the value assumptions of American society, let us consider a few from a list compiled by a sociologist, Robert Lynd, some years ago (Lynd, 1939, pp. 60–62).

"Democracy, as discovered and perfected by the American people, is the ultimate form of living together. All men are created free and equal,

¹⁸Some of the factors in the confrontation between young people and the values of society are discussed by Erich Fromm in "Values, Psychology, and Human Existence" (In A. H. Maslow, Ed., *New Knowledge in Human Values*. New York: Harper & Row, 1959) and by G. W. Allport in "Values and Our Youth" (*Teachers College Record*, 1961, 63, 211–219).

and the United States has made this fact a living reality."

BUT

"You would never get anywhere, of course, if you constantly left things to popular rule. No business could be run that way, and of course no businessman would tolerate it."

"Everyone should try to be successful."

BUT

"The kind of person you are is more important than how successful you are."

"Honesty is the best policy."

BUT

"Business is business, and a businessman would be a fool if he didn't cover his hand."

These items were chosen more or less at random from Lynd's list. Doubtless all of us could make a similar list of our own and, if we thought carefully about it, we could come out with a very long series of contradictions in the value schemes of American citizens.¹⁹

When we consider that the values of mature American citizens are as confused as these items would indicate, think what the situation is for children and adolescents who, if they are to get guidance at all, must necessarily look to their elders for it. It has been remarked over and over in publications that range from the daily newspapers to sophisticated research reports in sociology how often the actions of adults belie the moral teachings they pass on to their children. Too often the older generation "preaches water and drinks wine," and of course it usually gets caught at it.

Another factor that complicates the situation for the young person is the discrepancy between the professed value commitments of the older generation and those of his peers. Probably, there are always some differences to be found in this respect, even in relatively static societies. In a time of rapid social change, however, the differences can be, and usually are, very great. We have noted in earlier chapters that a crucial aspect of the developmental process is the child's moving away from, and perhaps rejecting in part, the values held by his parents, together with his increasing awareness of the demands the peer group places on him. No individual completely escapes this being torn between the values and desires of his parents and those of his peers. Today, this problem is particularly evident among young people of college age.

It is not the business of educational psychology to prescribe what values must be taught in the schools. Yet every teacher, who by necessity is a kind of applied

¹⁹For a study of American adolescents' value commitments as revealed in their interpretation of the First Amendment to the Constitution, see "Sweet Land of Liberty," by H. H. Remmers and R. D. Franklin (*Phi Delta Kappan*, 1962, 44, 22-27).

psychologist, must recognize that schools always do teach values of some kind. Some attitudes, some behavior patterns, are continually reinforced by the school, although as we have noted, these attitudes and behaviors are not always those the teacher consciously intended to teach. While the details of a subject may be forgotten quickly, *attitudes and personal valuations* of a subject field persist for long periods of time—often throughout the lifetime of an individual.

The development of internal controls

We have already considered the importance in the life of the child of suitable figures for identification, and we have seen that when worthy models are not available, the child has no choice but to imitate unworthy ones. There is one other matter, however, to which we have not given much attention. This is the development of inner controls, or what is often called *conscience*.

The term *conscience* is an inclusive one and heavily freighted with theological and philosophical connotations. Nevertheless, we need some word to denote the kind of inner controls that must be established if an individual is to behave ethically without constant supervision and threat of punishment. Freud called this the *superego*.

Although many people tend to think of conscience as unitary, that is, composed of one set of moral convictions that are internally consistent and are always applied regardless of the situation, contemporary research indicates this belief to be in error. Evidently, that which we call *conscience* is a complex of ideals and behavior patterns that are not necessarily completely consistent with one another (Berkowitz, 1964). For example, a person may, in principle, subscribe to the value of honesty and yet smuggle some article into the country to avoid paying duty on it. Someone who would be totally repelled by the thought of stealing money may fail to report all his income to the tax authorities. In short, a person holding deep-seated moral convictions about honesty in one kind of situation does not necessarily hold similar convictions about honest behavior in other situations. This means that (a) conscience is not a unitary thing and (b) the scope and intensity of a person's internal controls, or conscience, are a product of his experiences, including his discriminations about appropriate behavior in different kinds of situations.

One of the important elements in the learning of values is the making of judgments as to whether such and such an action or proposed action is right or wrong. An extensive investigation of judgmental processes in children was made by the Swiss psychologist Jean Piaget (1932).

Piaget believed that the development of moral judgment is a genetic process in which it is possible to discern relatively discrete stages. In the first stage, the child perceives the dominant adults in his life (parents and, probably, teachers) as being all-powerful authorities who hand down certain iron-clad rules for conduct that must be followed. In this stage of development the child tends to make judgments on the basis of objective consequences. For example, children who were interviewed by Piaget and his associates judged that a boy who broke fifteen teacups by an unavoidable accident was guiltier than a boy who broke only one cup while pilfering a cupboard to steal jam.

According to Piaget, this first stage, which he calls "the morality of constraint," ends at about the age of seven or eight and is succeeded by another in which cooperation and reciprocity are the distinguishing characteristics. In this stage, the child's attitude toward the dominant persons changes. He sees them now as figures deserving of mutual respect and cooperation. Moral rules are no longer seen as immutable but relative to circumstances, and the actions of other people may be judged more on the basis of their motives than on the strict objective consequences of their acts.

This stage persists until about age eleven or twelve at which time a more mature form of judgment appears. The distinguishing characteristic here is that the child judges actions in terms of the situation in which they occur. He is able to understand and to appreciate the causes that lead to action and, therefore, is more inclined to forgive certain kinds of behavior, something he was unlikely to do earlier—particularly in the first stage.

Piaget's work has attracted a great deal of attention and has emphasized the importance of this facet of the socialization of the child. However, many investigators are critical of his formulation. Part of the difficulty stems from Piaget's "stage theory" of development and is a difficulty that is inherent in all efforts to describe development in terms of a succession of discrete stages. It is true that Piaget conceives the development of moral judgment as a function of both genetic and environmental factors, but the tendency in his theory is to give a disproportionate emphasis to hereditary forces.

Investigators who have repeated Piaget's work in other societies have found that the greater the differences in child-rearing practices between a given society and the Swiss society in which Piaget's original work was done, the greater the differences are in children's processes of moral judgment (MacRae, 1954; Bronfenbrenner, 1962a). If it were solely a function of the unfolding of genetic potentials, this should not be the case. Apparently the social experience of the child is a major factor in both the content and the timing of the moral judgments he begins to make.²⁰

In any event, much of the groundwork for the development of conscience has already been laid before the child ever sees a teacher. The approach to discipline that the parents have used has had a profound influence. The child who has been controlled mostly by physical punishment is more apt to exhibit poorly developed inner controls and aggressive antisocial traits of behavior (remember Jerome in Chapter 4) than is the child whose training has involved extensive use of psychological techniques. There is considerable evidence to support the view that love-oriented methods of discipline are associated closely with children's development of strong internal controls.

The problem of teaching attitudes and values

Attitudes and values are among the most difficult learnings for a teacher to foster and develop. Lippitt (1945) has said, "It is now easier to smash an atom than to

²⁰Recent attempts to delineate the typical sequence of moral development in the U.S.A. are described in R. F. Peck and R. J. Havighurst, *The Psychology of Character Development* (New York: Wiley, 1960); L. Berkowitz, *The Development of Motives and Values in the Child* (New York: Basic Books, 1964); and Jane Loevinger, "The Meaning and Measurement of Ego Development" (*American Psychologist*, 1966, 21, 195-206).

break a prejudice" (p. 1). This is true because attitudes and values do not exist in a vacuum but are intertwined with the individual's entire personality structure. To try to change one layer of personality without recognizing the other layers is to show no understanding of the mechanism of personality.

Attitudes are always closely related to one's self-concept. *I like this. I am the kind of person that supports this sort of activity. I feel threatened by people like that, so I dislike them. I can do this well and it makes me feel good; I like it.* Of course, the process is not as conscious as this. But we *do* like and seek whatever makes us feel capable, smart, attractive, and adequate, and we set up protective barriers against whatever makes us feel inadequate, awkward, or unattractive. The individual who has unconscious feelings of inadequacy may build himself up by an attitude of superiority to other races. The child who fears failure may defend his ego by condemning and disliking school. A teen-age boy who thinks poetry is "for women" may increase his feelings of masculinity by rejecting poetry. A new attitude can be learned only when the student can feel that it offers no threat to his personal status.

Social considerations also play a part in the acceptance of attitudes and values. Very few attitudes are private; most of them represent a social distribution. Most people are reluctant to adopt an attitude disapproved by those on whom they depend for affection and approval. Holding approved attitudes helps us to fulfill deep psychological needs. If attitudes are deeply felt by the individual and confirmed by those around him, even a minor change will be difficult.

Nevertheless, changes in attitudes and values do occur. This can happen even at the expense of self-consistency. The boy who "hates" music may like one particular selection. The man who distrusts all foreigners may make an exception of a particular neighbor. Perhaps logically these positions are untenable, but to the average person they are commonplace rationalization.

There are obviously some attitudes that cannot be altered by the teacher, regardless of his skill in creating the proper setting. The more favorable the pupil's relationship with the teacher the better are the possibilities for change. But there are limits that teachers must realistically acknowledge. Many of these limits are the results of family, class, and age-mate culture over which the teacher has little control.

Take a high-school girl who comes from an economically secure family, a happy family, but one with very little concern for correct English. Every time she uses "ain't" in the classroom, her English teacher corrects her, until she even corrects herself about half the time. But do the efforts of the teacher really have a chance to effect a basic change in her attitude toward presentable English? For every lecture and every example given in school, there are hundreds of examples at home, at the soda fountain, and in the gang with whom she works on Saturday. Even her boy friend would think she was "stuck-up" if she talked as the teacher wishes.

The pressure of one's group identifications is strong. The teacher will make little headway against it. But often he can enlist the group to help him. The more a student's new attitudes can be reinforced by similar attitudes among his friends, the more chance they have for real effectiveness.

Often the teaching of new attitudes must start with skillful handling of pupil resistance by acceptance and understanding. If, instead, the teacher attacks pupil

resistance with counterresistance, he is likely to strengthen the pupil's original attitudes. Acceptance, on the other hand, frees the student from the need to defend his position, allowing him to look at it for what it really is. The successful teacher realizes the value of acceptance, the merit of permitting the expression of negative or opposing points of view.

For an attitude or value to develop, a child must have the capacity for it. As in other areas, teaching is futile unless the child is ready to learn. As in other areas, this means both a certain developmental level and a certain background of previous experience.

Attempts to develop an appreciation for democracy at the first-grade level show little similarity to such attempts at the senior high school level. The preadolescent's attitude toward sex and marriage cannot be expected to have the depth and reality of the college student's. The egocentric preschooler cannot appreciate fair play as the sixth-grader does. This is not to say that the beginnings of basic attitudes and value systems are not formed early, for we know they are. However, the teacher must use his knowledge of child development to determine the best approach for the age group in question; he also must be alert to wide individual differences in capacity and readiness within any group.

If a child is to develop a positive feeling for other races, he must have the ability to love and the capacity to identify with others. He must be concerned about others, interested in the welfare of others. This ability is largely a product of early life experiences. If the child does not have this basic capacity, he is unable to love any other person, much less a person of another race. Thus for him a change in racial attitude must be preceded by development of the general capacity to love. In cases of severe inadequacy of development, the help of a therapist may be needed.

It appears unlikely that any particular value can ever be forced on an individual. Parents, teachers, and others can show him the viable alternatives; they can help him learn to consider the foreseeable consequences of a proposed course of action; they can by their own actions set an example that will be worthy of emulation. But in the last analysis, what an individual prizes is a decision that he must make for himself on the basis of what *he* sees as valuable.

This is not to say teachers cannot have an important influence on the value judgments of their pupils. That they can seems certain, but what appears equally certain is that the approach must be mostly indirect. As Gordon Allport (1961b) has said, "Prescribed instruction in values would be laughed out of court." And he goes on to say, "Education for values occurs only when teachers teach what they themselves stand for, no matter what their subject is" (p. 216).

Doubtless it is easier to teach trigonometry and grammar than it is to teach honesty and integrity, but the teacher's role involves both kinds of responsibility. Surely there can be no more important task than that of providing for a core of experience that can lead to a set of socially responsible values as internally consistent as possible, together with the ability for self-control that obviates the need for continuous external pressure.²¹

²¹Louis E. Rath, Merrill Harmin, and Sidney B. Simon discuss in detail ways in which the school can contribute to the development of values in children. See their book *Values and Teaching* (Columbus, O.: Merrill, 1966).

Someone has defined a dictatorship as that form of government in which everything that is not required is prohibited. But the ideal of a democratic society is one in which free men choose freely and intelligently among alternatives, while subscribing to a central core of common values. The tricky thing is to know the difference between the two and this surely must be the reason that the learning of values is more complicated in a democracy.

CAN LEARNING BE "AUTOMATED"?

In this chapter we have noted several times the importance of (a) reinforcement through immediate feedback, (b) thorough mastery of the individual elements that make up a learning sequence, and (c) avoidance of practice on erroneous responses. These are important principles for teaching in any kind of situation, but it is often pointed out that under typical conditions of group teaching—which is what most classroom instruction is—it is difficult for a teacher always to live up to them.

From "talking typewriters" that teach preschoolers to read, to laboratories for group or individual language study in high schools and colleges, electronic equipment is invading American classrooms at an astonishing pace. Teachers who become resentful, fearing that the wave of electronic progress will somehow render them "obsolete," are short sighted in the extreme. The proliferation of teaching aids, whatever their nature, affords the teacher increased flexibility both in apportioning his own time and in designing learning experiences to fit the individual learner.



In recent years, partly as a result of the development of various technological devices, a movement has developed that would in effect redesign the teaching-learning process, making teaching more individualized and thereby making it possible to incorporate the above principles more fully. Since it seems impossible to accomplish this change in design by means of human teachers, the proposal is that we use technological devices to assume part of the work that traditionally has been done by the teacher.

In popular speech, devices that are designed to perform teaching functions usually are known as "teaching machines." This is not a particularly useful term since it is used to denote devices that range from simple plastic or cardboard containers to sophisticated electronic devices incorporating digital computers, film projectors, tape recorders, and other high-level technological paraphernalia. The fundamental purpose of all such machines is to present a *program* by means of which a student learns selected portions of subject matter. Such programs may also be presented in book form.

Whether the material is presented by means of a book or a mechanical or electronic device, the heart of the process is the program. A program presents a learner with a carefully graded series of stimulus situations (*frames*), each of which includes some information and requires the learner to make a response. He may be required to write out the answer to a question, to push a button indicating his choice among several possible answers, or, in the case of the machine built around a digital computer, to type his response on an electric typewriter. He is immediately told whether his response was correct or incorrect. This immediate feedback, which reinforces the response and prepares the learner for the next item, is an extremely important factor in effective learning behavior. Proponents of programmed learning maintain that the program is inestimably superior in this respect to the typical classroom procedure in which the student may wait minutes, hours, or even days for feedback from the teacher.

With some programs, if his response is incorrect, the student may be sent back immediately to repeat a series of frames or may be shown why his answer was wrong. In general, however, the program is designed in such a way that the great majority of responses will be correct, giving the learner an almost constant experience of success.²²

The preparation of the program is the crucial factor in programmed learning. No matter how sophisticated the device that presents the program may be, unless the program itself is expertly constructed, the learning process will not be efficient. Two general types of programing are in use today. One is the *linear* approach developed by B. F. Skinner. In a linear program, each student is presented with exactly the same sequence of frames. The material in the program is arranged so that every student will learn the desired responses and make very few errors in doing it. The allowance for individual differences lies in the varying amount of time different students will need to complete a program. A linear program may be presented by a machine or by a programmed book. Most programmed books today follow the linear approach.²³

²²The evolution, development, and potentialities of the teaching machine are discussed by B. F. Skinner, the man largely responsible for their appearance and popularity, in "Teaching Machines" and "The Science of Learning and the Art of Teaching," both of which are reprinted in his book *The Technology of Teaching* (New York: Appleton-Century-Crofts, 1968).

²³A pioneer programmed textbook is James G. Holland and B. F. Skinner, *The Analysis of Behavior* (New York: McGraw-Hill, 1961).

The other approach is called *branching* or *intrinsic* programing. Major credit for the development of this technique goes to N. A. Crowder.²⁴ Whereas in linear programs the material to be learned is broken up into numerous small segments, in intrinsic programs material is presented in somewhat larger units. Typically, the learner is presented with one or more paragraphs of material. The information is followed by a question and a number of possible answers. Each of these answers refers the student to a different page of the text (or a different button on the machine). If the answer he has selected is the correct one, he is referred to the next unit of information. If his response is incorrect, he finds an explanation of why it is wrong, and must respond again to the original question.

Intrinsic programing is sometimes presented in printed form, the so-called "scrambled book," but it is proving most useful in programing instructional devices based on digital computers.²⁵ The speed and flexibility of the computer make possible the development of programs that adjust to the particular needs, strengths, and weaknesses of an individual learner to an extent that is scarcely possible with linear programing. Another advantage claimed for computer-based instruction is that the machine can keep detailed records of an individual's performance.

As we saw earlier, some psychologists feel that the efficacy of programing lies in the fact it provides *reinforcement* of correct responses, thus making these responses more likely to occur on subsequent occasions. Yet a number of investigators have demonstrated that students who have only *read through* the programmed material have done as well on a subsequent test as those who have made the responses all the way through and have thus been "reinforced" (Evans et al., 1960; Roe, 1960). A more recent investigation by Krumboltz (1964) indicates that the response requirement may not be as important as has generally been thought. In these cases the structuring of the programmed material evidently made it possible for the learners to identify all the points to be learned, and exposure to them was enough for the learning to take place—active response and reinforcement were not needed. In most cases, however, one would expect that the activity of practicing a response would help the learner make it truly his own.

In the case of linear programs, it has long been held that the basic requirement is a strict sequence of logically related items. Yet Payne, Krathwohl, and Gordon (1967) found that the achievement of subjects who worked with a linear program in which the order of items had been mixed up did not differ significantly from the achievement of other subjects who worked through a program in which the items were in regular logical sequence. It is possible that many factors operate in the learning of programmed material besides immediate reinforcement and strict logical sequence.

Much research is now in progress on the construction of programs, the design of equipment, and the use of teaching machines with different kinds of subject matter. It is too early to tell just where they will eventually find their place, but a few observations can safely be made at this time.

²⁴See: N. A. Crowder, "Automatic Tutoring by Means of Intrinsic Programming," Chapter 10 in E. H. Galanter, Ed., *Automatic Teaching: The State of the Art* (New York: Wiley, 1959).

²⁵The Reading at the end of this chapter describes the use of computers in automated instruction. Another good reference on this topic is "The Development and Current Status of Computer-Based Instruction," by Walter Dick (*American Educational Research Journal*, 1965, 2, 41–54).

Since programing is based on the principle of telling the learner at once whether he is right or wrong, its utility will of necessity be limited to material where there is a *right answer*. Structured information, concepts, relationships, associations, differentiations, abstractions, identification of key elements—all these are of such a nature that they can be put into programs calling for a series of "correct" responses. Much school learning is of this kind. But much of it is not—for example, where value judgments must be made. Sometimes the most important thing for a pupil to learn is that there are *not* any pat answers. As Kvaraceus (1961) has said,

Unfortunately, few personal, social, economic or political problems that are met in everyday living tend to be clear, simple, or categorical. Furthermore the more crucial and far-reaching outcomes of learning will always be found at the level of interpretation, application, appreciation and invention. These levels are still outside the reach of most self-learning devices and thereby place a low ceiling on what is to be mastered (p. 289).²⁶

A machine can provide informational background, but beyond this, where intelligent opinion can differ, it can only help identify the alternatives. It cannot ask any question requiring original, different answers. It cannot ask "what do you think and why" questions. Nor can it ask questions that need more than a few words to answer. Questions whose answers require a complex formulation by the learner would have to come outside the scope of the teaching machine.

Finally, the kind of learning that can come out of an experience is limited by the quality of that experience. For motor learning, you need motor experience; for emotional and social learning, you need emotional and social experience. The learning possible from teaching machines will be limited to the learning that can come through the experience of reading (or perhaps listening to) a series of items and answering a question about each one. This pretty well limits the content to visual (or auditory) and ideational learning. Motor skills, social skills, and attitudes probably cannot be taught efficiently by machines, though the relevant *information* needed for them can be. Habits of independent study, skills of democratic leadership and membership, and originality would probably not be suitable "content" for programing, although some advocates of programed learning see it as a key device in enhancing pupil creativity.

There seems to be wide agreement that where teaching machines or other devices for presenting programed material are used, teachers will still have to design or help design the programs, for it is they who know the steps by which the ideas in the field they teach can be grasped by students. In a given subject, some students will need much easier programs than others, and it will be the teacher's responsibility to match programs to students. It is anticipated that the machines will make some types of pupil learning more efficient and that they will permit teachers to devote less time to mechanical tasks and more to bringing out meanings and applications of new material. In a number of cases, for example, teachers have found that if students have gone through a programed sequence covering

²⁶For a critical evaluation of the status of educational technology, see "The Myths of Educational Technology," by Anthony G. Oettinger (*Saturday Review*, May 18, 1968, 51, 76-77).

basic concepts and terminology, class lectures and discussions can go much farther than would otherwise have been possible. The students' mistakes on the program also can give the teacher precise information as to where his help is needed (Galanter, 1959; Lumsdaine and Glaser, 1960). As teachers find ways in which programing can help them meet some of their objectives, it will be especially important for them to continue to make other provisions for meeting objectives not amenable to this approach.²⁷

²⁷Those who wish to go further into the study of programmed learning will find useful material in John E. Coulson, Ed., *Programmed Learning and Computer-Based Instruction* (New York: Wiley, 1962). For an intensive analysis for teachers of the development and potentialities of automated teaching, including a review of considerable research, see L. M. Stolurow's *Teaching by Machine* (Cooperative Research Monograph No. 6, U.S. Department of Health, Education, and Welfare, 1961). The entire March 1963 edition of *The Phi Delta Kappan* (Vol. 44) is devoted to articles on programing and programmed learning. The June-July 1962 issue of *The Journal of Educational Research* (Vol. 55) is made up of technical papers on programmed instruction.

Task 4 MOTOR LEARNING

Write the word "learning" 30 times with your left hand if you are right-handed, otherwise with your right hand. Try to improve the speed and quality of your writing. When you have finished, turn back to page 231 and continue reading.

This image shows a single sheet of off-white or cream-colored paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slightly textured appearance and some minor discoloration or aging marks. There is no handwriting or printed text on the page.

Task 5 CONCEPT FORMATION

In this task you will form a concept through successive trials. During each trial, place a ruler or piece of heavy paper along the dotted line below that trial. After you have made your response, move the ruler down to the next dotted line and proceed with the next trial.

In each trial you will look at a design and try to determine whether it is a “mib” or not. After a few trials you will begin to have hypotheses about what a mib is. Testing these through succeeding trials, you will gradually discover what properties a mib does and does not have. In the end you will have an accurate concept of a mib.

When you have pencil and ruler or paper ready, turn the page and begin.

Task 5, continued

Trial 1



check one

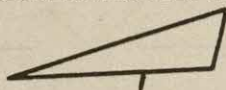
This is a mib

Is this a mib?

yes____no____

Trial 2

The second figure in trial 1 is not a mib



Is this a mib?

yes____no____

Trial 3

Trial 2 is not a mib

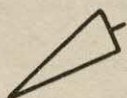


Is this a mib?

yes____no____

Trial 4

Trial 3 is a mib

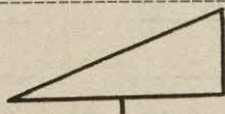


Is this a mib?

yes____no____

Trial 5

Trial 4 is a mib



Is this a mib?

yes____no____

Trial 6

Trial 5 is not a mib

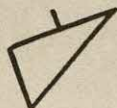


Is this a mib?

yes____no____

Trial 7

Trial 6 is a mib



Is this a mib?

yes____no____

Trial 8

Trial 7 is not a mib



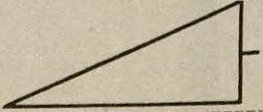
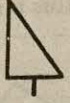
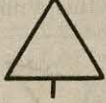
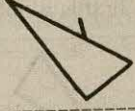
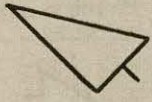
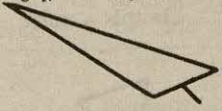
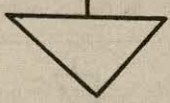
Is this a mib?

yes____no____

Invert book and continue Task 5 on next page →

Task 5, continued

Return book to normal position and continue Task 5 on next page

Trial 9	Trial 8 is not a mib		Is this a mib?	yes — no —
Trial 10	Trial 9 is a mib		Is this a mib?	yes — no —
Trial 11	Trial 10 is a mib		Is this a mib?	yes — no —
Trial 12	Trial 11 is a mib		Is this a mib?	yes — no —
Trial 13	Trial 12 is not a mib		Is this a mib?	yes — no —
Trial 14	Trial 13 is not a mib		Is this a mib?	yes — no —
Trial 15	Trial 14 is a mib		Is this a mib?	yes — no —
Trial 16	Trial 15 is not a mib		Is this a mib?	yes — no —

Task 5, continued

Trial 17

Trial 16 is not a mib



Is this a mib?

Check one

yes____no____

Trial 18

Trial 17 is not a mib



Is this a mib?

yes____no____

Trial 19

Trial 18 is a mib

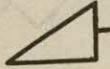


Is this a mib?

yes____no____

Trial 20

Trial 19 is not a mib



Is this a mib?

yes____no____

Trial 21

Trial 20 is a mib



Is this a mib?

yes____no____

Trial 22

Trial 21 is not a mib



Is this a mib?

yes____no____

Trial 23

Trial 22 is not a mib



Is this a mib?

yes____no____

Trial 23 is a mib

Now read the footnote at the bottom of page 296.

Task 6 PROBLEM SOLVING

Try to solve the following problems, making a note of the processes you go through. You can check your solutions against those given on page 611.

1. A man and a girl walking together step out with their left feet first. The man walks 3 paces while the girl walks 2. When will they both put their *right* feet forward together? (Kaufman, 1954, p. 118).

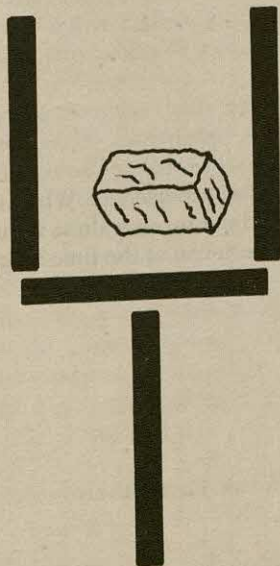
2. A suburban commuter is regularly met at the train at 5:30 by his wife and driven home. One day, not feeling well, he takes an earlier train, starts walking home from the station, eventually meets his wife coming to get him at the usual time. He then rides the rest of the way home with her and gets home 10 minutes earlier than usual. What time did he meet her?

3. Al, Bill, and Chuck sat down at the soda fountain and ordered milkshakes: one chocolate, one strawberry, and one vanilla. As they waited to be served, they discussed their plans for the following year. One had just been admitted to law school, one had a job teaching physics, and one planned to enter his father's business.

The future businessman sat next to Chuck, and Bill's neighbor had ordered a vanilla milkshake. The law student sat next to the person who had ordered the strawberry milkshake. Chuck was allergic to strawberries; the law student, who was Al's roommate, did not like chocolate.

When the clerk finally brought their order, which milkshake did he give to the student in the middle? What was this student's name? His future career?

4. Look at the figure below, which represents an ice cube in a water goblet. Place four paper clips, matches, or other small objects over the four bars which make up the outlines of the goblet. By moving two clips, and only two, can you re-form the goblet in a different position so that the ice cube is no longer inside it? The goblet need not remain upright, but it may not be altered in shape.

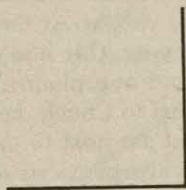


Task 7 EXPLORING FACTORS IN CREATIVITY

1. You are an editor assigned to come up with the most appropriate title you can for a short story. The plot, briefly, concerns a missionary who is about to be boiled and eaten by cannibals. He is already in the pot when he is told that he will be spared if he will marry a princess of the tribe. He declines the offer and is boiled alive.

Your title: _____

2. Embellish the figure below in any way you wish.



3. What is the most creative thing you have done in the last two years? What made it creative? What were the conditions in you and in your setting that fostered creativity in this case? Jot your answers below.

4. Think back over your school experience. What is the most creative school activity you can recall? What did the teacher do to induce or encourage creativity? How did you feel about the experience at the time? Again jot your answers below.

5. Now turn to page 616 and finish Task 7 there.

COMPUTER TECHNOLOGY AND THE FUTURE OF EDUCATION

Teaching machines, language laboratories, and now digital computers. It looks as though the electronic age is taking over the field of education. What's it all about? Is the human teacher becoming obsolete? Are we really headed for that cartoonist's world in which the school system is a vast production line where children, like empty tin cans, are fed into one end of the machine and come out the other end neatly capped and gowned, their heads crammed with knowledge? In this article Patrick Suppes, head of a Stanford University project in computer-assisted instruction, discusses the potentials of the computer as a teaching tool and tells us what can be expected of it in the future.

Current applications of computers and related information-processing techniques run the gamut in our society from the automatic control of factories to the scrutiny of tax returns. I have not seen any recent data, but we are certainly reaching the point at which a high percentage of regular employees in this country are paid by computerized payroll systems. As another example, every kind of complex experiment is beginning to be subject to computer assistance either in terms of the actual experimentation or in terms of extensive computations integral to the analysis of the experiment. These applications range from bubble-chamber data on elementary particles to the crystallography of protein molecules.

As yet, the use of computer technology in administration and management on the one hand, and scientific and engineering applications on the other, far exceed direct applications in education. However, if potentials are properly realized, the character and nature of education during the course of our lifetimes will be radically changed. Perhaps the most important aspect of computerized instructional devices is that the kind of individualized instruction once possible only for a few members of the aristocracy can be made available to all students at all levels of abilities.

Because some may not be familiar with how computers can be used to provide individualized instruction, let me briefly review the mode of operation. In the first place, because of its great speed of operation, a computer can handle simultaneously a large number of students—for instance, 200 or more, and each of the 200 can be at a different point in the curriculum. In the simplest mode of operation, the terminal device at which the student sits is something like an electric typewriter. Messages can be typed out by the computer and the student in turn can enter his responses on the keyboard. The first and most important feature to add is the delivery of audio messages under computer control to the student. Not only children, but students of all ages learn by ear as much as by eye, and for tutorial ventures in individualized instruction it is essential that the computer system be able to talk to the student.

From *Phi Delta Kappan*, April 1968. Reprinted by permission.

A simple example may make this idea more concrete. Practically no one learns mathematics simply by reading a book, except at a relatively advanced level. Hearing lectures and listening to someone else's talk seem to be almost psychologically essential to learning complex subjects, at least as far as ordinary learners are concerned. In addition to the typewriter and the earphones for audio messages, the next desirable feature is that graphical and pictorial displays be available under computer control. Such displays can be provided in a variety of formats. The simplest mode is to have color slides that may be selected by computer control. More flexible, and therefore more desirable, devices are cathode-ray tubes that look very much like television sets. The beauty of cathode-ray tubes is that a graphical display may be shown to the student and then his own response, entered on a keyboard, can be made an integral part of the display itself.

This is not the place to review these matters in detail; but I mean to convey a visual image of a student sitting at a variety of terminal gear—as it is called in the computer world. These terminals are used to provide the student with individualized instruction. He receives information from audio messages, from typewritten messages, and also from visual displays ranging from graphics to complex photographs. In turn, he may respond to the system and give his own answers by using the keyboard on the typewriter. Other devices for student response are also available, but I shall not go into them now.

So, with such devices available, individualized instruction in a wide variety of subject matters may be offered students of all ages. The technology is already available, although it will continue to be improved. There are two main factors standing in our way. One is that currently it is expensive to prepare an individualized curriculum. The second factor, and even more important, is that as yet we have little operational experience in precisely how this should best be done. For some time to come, individualized instruction will have to depend on a basis of practical judgment and pedagogical intuition of the sort now used in constructing textbook materials for ordinary courses. One of the exciting potentialities of computer-assisted instruction is that for the first time we shall be able to get hard data to use as a basis for a more serious scientific investigation and evaluation of any given instructional program.

To give a more concrete sense of the possibilities of individualized instruction, I would like to describe briefly three possible levels of interaction between the student and computer program. Following a current usage, I shall refer to each of the instructional programs as a particular system of instruction. At the simplest level there are *individualized drill-and-practice systems*, which are meant to supplement the regular curriculum taught by the teacher. The introduction of concepts and new ideas is handled in conventional fashion by the teacher. The role of the computer is to provide regular review and practice on basic concepts and skills. In the case of elementary mathematics, for example, each student would receive daily a certain number of exercises, which would be automatically presented, evaluated, and scored by the computer program without any effort by the classroom teacher. Moreover, these exercises can be presented on an individualized basis, with the brighter students receiving exercises that are harder than the average, and the slower students receiving easier problems.

One important aspect of this kind of individualization should be emphasized. In using a computer in this fashion, it is not necessary to decide at the beginning of

the school year in which track a student should be placed; for example, a student need not be classified as a slow student for the entire year. Individualized drill-and-practice work is suitable to all the elementary subjects which occupy a good part of the curriculum. Elementary mathematics, elementary science, and the beginning work in foreign language are typical parts of the curriculum which benefit from standardized and regularly presented drill-and-practice exercises. A large computer with 200 terminals can handle as many as 6,000 students on a daily basis in this instructional mode. In all likelihood, it will soon be feasible to increase these numbers to a thousand terminals and 30,000 students. Operational details of our 1965-66 drill-and-practice program at Stanford are to be found in the forthcoming book by Suppes, Jerman, and Brian (1968).

At the second and deeper level of interaction between student and computer program there are *tutorial systems*, which take over the main responsibility both for presenting a concept and for developing skill in its use. The intention is to approximate the interaction a patient tutor would have with an individual student. An important aspect of the tutorial programs in reading and elementary mathematics with which we have been concerned at Stanford in the past three years is that every effort is made to avoid an initial experience of failure on the part of the slower children. On the other hand, the program has enough flexibility to avoid boring the brighter children with endlessly repetitive exercises. As soon as the student manifests a clear understanding of a concept on the basis of his handling of a number of exercises, he is moved on to a new concept and new exercises. (A detailed evaluation of the Stanford reading program, which is under the direction of Professor Richard C. Atkinson, may be found in the report by Wilson and Atkinson (1967). A report on the tutorial mathematics program will soon be available. The data show that the computer-based curriculum was particularly beneficial for the slower students.)

At the third and deepest level of interaction there are *dialogue systems* aimed at permitting the student to conduct a genuine dialogue with the computer. The dialogue systems at the present time exist primarily at the conceptual rather than the operational level, and I do want to emphasize that in the case of dialogue systems a number of difficult technical problems must first be solved. One problem is that of recognizing spoken speech. Especially in the case of young children, we would like the child to be able simply to ask the computer program a question. To permit this interaction, we must be able to recognize the spoken speech of the child and also to recognize the meaning of the question he is asking. The problem of recognizing meaning is at least as difficult as that of recognizing the spoken speech. It will be some time before we will be able to do either one of these things with any efficiency and economy.

I would predict that within the next decade many children will use individualized drill-and-practice systems in elementary school; and by the time they reach high school, tutorial systems will be available on a broad basis. Their children may use dialogue systems throughout their school experience.

If these predictions are even approximately correct, they have far-reaching implications for education and society. As has been pointed out repeatedly by many people in many different ways, the role of education in our society is not simply the transmission of knowledge but also the transmission of culture, including the entire range of individual, political, and social values. Some recent

studies—for example, the Coleman report—have attempted to show that the schools are not as effective in transmitting this culture as we might hope; but still there is little doubt that the schools play a major role, and the directions they take have serious implications for the character of our society in the future. Now I hope it is evident from the very brief descriptions I have given that the widespread use of computer technology in education has an enormous potential for improving the quality of education, because the possibility of individualizing instruction at ever deeper levels of interaction can be realized in an economically feasible fashion. I take it that this potentiality is evident enough, and I would like to examine some of the problems it raises, problems now beginning to be widely discussed.

Three rather closely related issues are particularly prominent in this discussion. The first centers around the claim that the deep use of technology, especially computer technology, will impose a rigid regime of impersonalized teaching. In considering such a claim, it is important to say at once that indeed this is a possibility. Computer technology could be used this way, and in some instances it probably will. This is no different from saying that there are many kinds of teaching, some good and some bad. The important point to insist upon, however, is that it is certainly not a *necessary* aspect of the use of the technology. In fact, contrary to the expectations sometimes expressed in the popular press, I would claim that one of the computer's most important potentials is in making learning and teaching more personalized, rather than less so. Students will be subject to less regimentation and lockstepping, because computer systems will be able to offer highly individualized instruction. The routine that occupies a good part of the teacher's day can be taken over by the computer.

It is worth noting in this connection that the amount of paper work required of teachers is very much on the increase. The computer seems to offer the only possibility of decreasing the time spent in administrative routine by ordinary teachers. Let us examine briefly one or two aspects of instruction ranging from the elementary school to the college. At the elementary level, no one anticipates that students will spend most of their time at computer consoles. Only 20 to 30 percent of the student's time would be spent in this fashion. Teachers would be able to work with classes reduced in size. Also, they could work more intensely with individual students, because some of the students will be at the console and, more importantly, because routine aspects of teaching will be handled by the computer system.

At the college level, the situation is somewhat different. At most colleges and universities, students do not now receive a great deal of individual attention from instructors. I think we can all recognize that the degree of personal attention is certainly not less in a computer program designed to accommodate itself to the individual student's progress than in the lecture course that has more than 200 students in daily attendance.

A second common claim is that the widespread use of computer technology will lead to excessive standardization of education. Again, it is important to admit at once that this is indeed a possibility. The sterility of standardization and what it implies for teaching used to be illustrated by a story about the French educational system. It was claimed that the French minister of education could look at his

watch at any time of the school day and say at once what subject was being taught at each grade level throughout the country. The claim was not true, but such a situation could be brought about in the organization of computer-based instruction. It would technically be possible for a state department of education, for example, to require every fifth-grader at 11:03 in the morning to be subtracting one-fifth from three-tenths, or for every senior in high school to be reciting the virtues of a democratic society. The danger of the technology is that edicts can be enforced as well as issued, and many persons are rightly concerned at the spectre of the rigid standardization that could be imposed.

On the other hand, there is another meaning of standardization that holds great potential. This is the imposition of educational standards on schools and colleges throughout the land. Let me give one example of what I mean. A couple of years ago I consulted with one of the large city school systems in this country in connection with its mathematics program. The curriculum outline of the mathematics program running from kindergarten to high school was excellent. The curriculum as specified in the outline was about as good as any in the country. The real source of difficulty was the magnitude of the discrepancy between the actual performance of the students and the specified curriculum. At almost every grade level, students were performing far below the standard set in the curriculum guide. I do not mean to suggest that computer technology will, in one fell stroke, provide a solution to the difficult and complicated problems of raising the educational standards that now obtain among the poor and culturally deprived. I do say that the technology will provide us with unparalleled insight into the actual performance of students.

Yet I do not mean to suggest that this problem of standardization is not serious. It is, and it will take much wisdom to avoid its grosser aspects. But the point I would like to emphasize is that the wide use of computers permits the introduction of an almost unlimited diversity of curriculum and teaching. The very opposite of standardization can be achieved. I think we would all agree that the ever-increasing use of books from the sixteenth century to the present has deepened the varieties of educational and intellectual experience generally available. There is every reason to believe that the appropriate development of instructional programs for computer systems will increase rather than decrease this variety of intellectual experience. The potential is there.

The real problem is that as yet we do not understand very well how to take advantage of this potential. If we examine the teaching of any subject in the curriculum, ranging from elementary mathematics to ancient history, what is striking is the great similarity between teachers and between textbooks dealing with the same subject, not the vast differences between them. It can even be argued that it is a subtle philosophical question of social policy to determine the extent to which we want to emphasize diversity in our teaching of standard subjects. Do we want a "cool" presentation of American history for some students and a fervent one for others? Do we want to emphasize geometric and perceptual aspects of mathematics more for some students, and symbolic and algebraic aspects more for others? Do we want to make the learning of language more oriented toward the ear for some students and more toward the eye for those who have a poor sense of auditory discrimination? These are issues that have as yet

scarcely been explored in educational philosophy or in discussions of educational policy. With the advent of the new technology they will become practical questions of considerable moment.

The third and final issue I wish to discuss is the place of individuality and human freedom in the modern technology. The crudest form of opposition to widespread use of technology in education and in other parts of our society is to claim that we face the real danger of men becoming slaves of machines. I feel strongly that the threat to human individuality and freedom in our society does not come from technology at all, but from another source that was well described by John Stuart Mill more than a hundred years ago. In discussing precisely this matter in his famous essay *On Liberty*, he said,

the greatest difficulty to be encountered does not lie in the appreciation of means towards an acknowledged end, but in the indifference of persons in general to the end itself. If it were felt that the free development of individuality is one of the leading essentials of well-being; that it is not only a co-ordinate element with all that is designated by the terms civilization, instruction, education, culture, but is itself a necessary part and condition of all those things; there would be no danger that liberty should be undervalued, and the adjustment of the boundaries between it and social control would present no extraordinary difficulty.

Just as books freed serious students from the tyranny of overly simple methods of oral recitation, so computers can free students from the drudgery of doing exactly similar tasks unadjusted and untailored to their individual needs. As in the case of other parts of our society, our new and wondrous technology is there for beneficial use. It is our problem to learn how to use it well. When a child of six begins to learn in school under the direction of a teacher, he hardly has a concept of a free intelligence able to reach objective knowledge of the world. He depends heavily upon every word and gesture of the teacher to guide his own reactions and responses. This intellectual weaning of children is a complicated process that we do not yet manage or understand very well. There are too many adults among us who are not able to express their own feelings or to reach their own judgments. I would claim that the wise use of technology and science, particularly in education, presents a major opportunity and challenge. I do not want to claim that we know very much yet about how to realize the full potential of human beings; but I do not doubt that we can use our modern instruments to reduce the personal tyranny of one individual over another, wherever that tyranny depends upon ignorance.

Note on Task 5: For a laboratory experiment on concept formation using mibs, see K. L. Smoke, "An Objective Study of Concept Formation" (*Psychological Monographs* 1932, 42, No. 4, Whole No. 191). A mib, as you may have discovered, is a right triangle of any size, in any position, with a short line protruding at right angles from the shortest side. Now turn back to page 241 and continue reading.

GROUP ASPECTS OF LEARNING

Classroom groups and a myriad of informal social amalgamations are still the major format of the contemporary school. It is difficult for most of us even to imagine a school without collections of youngsters working under the direction of a teacher. As we saw in Chapter 1, this collection has less homogeneity than the label may imply, for the individual differences are impressive. Unfortunately, individual differences are not dissolved in the group complex, but they are too often ignored. The fact that some pupils know more about a given subject the first day than others know at the end of the term is not a matter most teachers consider. Increasing attention is being given to individualized learning, including independent study, teaching machines, language carrels, tutorials, and laboratories of all types, not to mention homework. But the pupil still spends more time learning in social situations than in isolated ones.

The teacher's concern with group psychology is threefold. First of all, the group is the setting for the individual's learning. The student's learning is all his own, and is essentially a private experience. But it takes place with the help of an authority figure and in the presence of his sibling-like peers. He not only learns *in* the group, he learns *from* the group. Members of the class function, in effect, as "assistant teachers." One pupil's question may help another. One pupil's insight may serve as another's cue. And pupils serve as storehouses of information (and misinformation) on almost any topic or process the school teaches.

When the pupil recites, he does so in a classroom. What he produces in art class or shop is observed by others and commented upon directly or by innuendo. He is responsible to group codes concerning relationship to authority and the amount of interest and effort to be put forth. His performance is exposed to the group for whatever comfort or pain may result.

Thus the group presents many stimuli in the shape of distractions and encouragements, codes and expectations. Group life is laden with rewards and punishments. The group can accept or reject. It has ways, overt or covert, of reinforcing certain types of behavior and squelching others. Unless the teacher is well aware of the group codes and sanctions, efforts to motivate and manage may prove ineffective in the face of peer reinforcement of contrary behavior. (Of

course, one must always remember that the "group" which does all these things is not some mystic entity; it is a number of individuals acting in concert.)¹

The teacher's second concern with group psychology stems from the fact that some areas of learning are inseparable from group life. They cannot be taught in a social vacuum except as empty verbalisms. Just as one needs a science laboratory to learn through experiments, so he needs a social laboratory to learn certain skills and attitudes.

What are these learnings for which the group is particularly relevant? First, there are the things one learns about oneself as a social being—one's role in the group. This is the kind of learning that takes place whether planned or not, but the teacher with forethought can orient the experience toward the desired goals. Here we think of such important learnings as the basic acceptance of oneself as a worth-while, productive, and responsible person. Getting along with people, working cooperatively with peers, and respecting the rights of others are things that can be learned and practiced only in a group setting. Kindergartners learning to share and "take turns," eighth-graders planning a Thanksgiving Day program, teenagers conducting a Student Council election—all are learning skills for which the group is the only possible laboratory. And how can one learn empathic responses to another person out of a book?

In a democratic society where group processes are such a vital part of the culture, some of the most important skills are those which have to do with group participation and leadership. How does one learn to lead a group? The teacher serves as a model, of course—but the teacher is an adult, in a fairly remote power role, and furthermore, mere demonstration is not enough. Pupils need an opportunity for practice in elected or assigned leadership roles. Cooperative group problem solving is also a natural part of many classroom activities. Practice in setting goals and evaluating group progress is much more effective when the group situation has not been created artificially but arises naturally out of the task at hand. The teacher must remember, however, that group skills are not learned automatically just through participation in group situations—time must be taken to analyze the process.

Finally, there is the matter of the teacher's own role as group leader in the organization and management of the classroom. If you appear suddenly in the doorway of your classroom, you may well see your leadership style being depicted by one of the pupils much to the amusement of the class. But the shock of seeing yourself through their eyes may not be amusing. It is important to develop an awareness of one's own style, as was indicated in Chapter 1.

THE INDIVIDUAL AND THE GROUP

Of course school is not the child's only group experience, nor is it his first one. By the time he starts school he has been functioning as a member of various groups for five or six years:

¹For an analytic and comprehensive review of research on group processes relevant to the classroom see "The Structure and Dynamics of Classroom Groups and Education Systems" by G. Jensen and T. Parsons (*Review of Educational Research*, 1959, 29, 334–356). A concise and practical book for teachers and others eager to make the most constructive use of group processes is *Working with Groups* by W. M. Lifton (New York: Wiley, 1961).

The first group in the experience of a human being is the *mother-child* dyad. This mother-child relationship forms the undergirding for the fundamental capacity for sympathy and love for others. Because the mother represents the whole world to her infant, her reaction to him becomes the reaction he expects from others. If she is kind, the world is kind. He finds it possible to reach out to this world, for it meets his needs. If she is unkind, if she denies his fundamental need for love, he expects the world to deny him, too.

The mother-child group expands to include the father and others in the family, with less of the one-to-one intensity but with the same power to influence the child's later reactions to people outside the immediate family circle. He will come to expect the sort of treatment outside of the home that he gets inside.

Thus, as we learned in Chapter 3, the *family* group becomes the primary social force for the young child. The child incorporates certain attitudes and feelings, certain ways of behaving, from his family. The family sets up the framework of expectations which the child tries to meet. It may expect him to be quiet, to obey, to be resourceful, to cooperate, to do well in school, to keep out of the way, to fight or not to fight, and so on. The role he learns within the family pattern will be tried in other group situations.

As the child grows from the utter dependence of infancy into a more independent social being, able to communicate with others, his social needs are extended and his group relations are broadened to include his age-mates, or *peers*. The same needs for security, a sense of belonging, and attention enter into his peer relationships. The patterns he learned in the family for meeting these needs are carried into all his new group activities. The farther he moves from his family group, the more important it is to meet his needs within the other groups he enters. The adequacy of his family relationships also affects the extent to which he must fulfill his needs outside the family circle.

A great deal of the child's group life is with his age-mates. Children will form small cliques, groups, and organized "gangs," sometimes with an elaborate internal structure but more often with a fluid, spontaneous structure. The function of these groups at various ages has been discussed in previous chapters.

No two children have identical places within a group; each has a distinct set of relationships. The amount of personal freedom the child feels within a particular group is an important factor in the relations he establishes in that group. Much of this freedom is determined by the sense of personal adequacy he develops at home and elsewhere. But it also depends upon the lines drawn within the social structure of society.

We are all limited to some extent. If we live in certain areas of our community, we are likely to belong to certain groups and not to others. Within particular groups, depending upon our sense of freedom, we can expect to assume certain roles. Perhaps leadership roles will be included, perhaps not. The name we bear, the work we do, the degrees we hold, our place in society, play a large part in defining the roles we play in our social and group living.

The most obvious influence of the effect of group social structure can be seen in the role of minority group persons, whose freedom of movement within the community is frequently circumscribed. Many such persons can live only in certain areas, send their children to certain schools, attend certain churches, shop in certain stores. Job opportunities are limited, and only with great effort can they

hope to utilize their full capacities. Naturally this affects the individual's sense of personal adequacy which, in turn, colors his whole behavior.

If a youngster's group experience is one of continuous restriction and rejection, his social adjustment can hardly be expected to be wholesome. One of the aims of a democratic culture is to extend the space of free movement for everyone.

How group influence operates

There is considerable confusion regarding the relationship between individual productivity and the group setting for two reasons. One is that schools and classroom groups develop their own idiosyncratic patterns which defy generalization. In one school social recognition and academic achievement may go hand in hand while in another school they do not. This is why each group must be studied. The other reason for the confusion is a basic multiple phenomenon which is apparent in relationships. Often factors covary even though they may not be causally related. For example, the intelligent pupil makes more able judgments about his environment, tends to be more appealing physically, can do better academically and thus usually has less difficulty in school, and relates to peers more successfully. As we say, he has a lot going for him. Success begets more success just as failure begets more failure. We operate from a base of adequacy. For this reason sociometric ratings will be related to academic performance but the correlations will usually be low: one cannot, therefore, make predictions about individual pupils.

What are some of the ways in which groups can influence the individuals who belong to them? For one thing, groups exert pressure toward conformity. The degree of pressure depends on the group, its cohesion, and the uniformity of its values.

Berenda (1950) found that in a group made up of age-mates there was a great deal of acquiescing to majority opinion even when the majority was known to be wrong. When the teacher tried to persuade an individual to change his opinion contrary to the majority, she had some influence with children ten years of age and under, but very little influence with older children. The more ambiguous the stimulus situation, the more the individual tended to follow the group.

An experiment by Asch (1951) substantiates Berenda's findings. One third of Asch's college-student subjects gave a report contrary to what they actually observed when they found themselves repeatedly the only member with a divergent opinion. The group members who did hold to their own "better" judgment even when they differed from the majority tended to be more secure as individuals. Those who changed tended to lack confidence, to feel inferior, and to have a greater need to identify with the group.²

The group's power is derived in part from contagion of spirit. Contagion can sweep over a group and move it to enthusiasm or hostility. It is a nebulous thing, but it can often mean the difference between a group's acceptance of people, ideas, and activities and its rejection of them.

Two elements can be identified in the phenomenon called contagion. The first is a goal commonly accepted or identified on the part of the group members. This

²See also "Opinions and Social Pressure" by S. E. Asch (*Scientific American*, 1955, 193 (5), 31-35).

goal may be almost anything from getting a job done to annoying the teacher. It acts in a cyclic fashion, both depending upon and further establishing the mood of the group until it becomes the generalized attitude.

The goal may originate with one person or with a few. In any group there are leaders who influence the others (Redl, 1966). They are usually members with high group prestige. In some instances they may be of lower status in the group, but because they act impulsively, they help the others to break through social restraints (Grosser, Polansky, and Lippitt, 1951). They are able to turn the tide one way or another with the result that the entire group seems to think, feel, and act as a unit. Different members gain power at different times because of the particular activity or mood of the group.

The second element in contagion is ease of communication among members. Barriers are broken down and communication spreads like a flood. Such communication is often not verbal. It may be a gesture, a nod, a show of resistance.

At all ages, confusion may be caused by a disparity between the values of society at large, as expressed by the teacher, and the values of the peer group in which the action is taking place. If a person chooses either one code or the other, he is in conflict with the one he does not choose. If he attempts to straddle both codes he becomes confused as to the meaning of either one. Often youngsters solve this problem by giving lip service to the teacher's code while behaving according to the code of their age-mates.

Kelly (1966) has studied the manner in which new youngsters are "indoctrinated" into local ways. He has found that in schools with high pupil turnover, the new student is given suggestions on how to act and is watched to see if he fits in. But in more stable schools with a fixed peer society, the newcomer is likely to get little communication of any type unless he reaches out himself.

Especially at the high-school level, there is often a culture within the culture and a school within the school. By this we mean that to a significant degree the students have their own set of values and their own web of influences which determine their aspirations and their investment in various life activities—especially their involvement in school learning. The power of the peer culture is accentuated by the fact that in our society, unlike many other societies, teen-agers often associate almost entirely with each other; instead of developing a feeling of belonging to the larger society, they understandably come to have a consciousness of themselves as a group apart, with special needs, values, and wisdom that benighted non-teen-agers cannot understand very well. Bronfenbrenner (1968) has shown that American children are far more responsive to their peers than to adults, while the reverse is true of Russian children. He traces this to differences in child-rearing patterns in the two countries.³

J. S. Coleman (1961), who has made an extensive study of high-school culture, has found marked differences in the climates of different schools, implying that teachers can build a desirable school climate if they go about it in the right way. He feels that attention should be given to ways of generating internal cohesion and identification "as a school" so that the adolescent's effort is for more than just himself. Thus he recommends establishing many channels in addition to athletics

³Some of Bronfenbrenner's findings are reported in the Reading at the end of this chapter. For another study of peer vs. adult influence, see "Social Support and Rejections of Organizations Standards" by A. Zander and T. Curtis (*Journal of Educational Psychology*, 1965, 56, 87–96).

whereby students can bring distinction to their school and more intergroup (rather than individual) competition in debating, music, drama, science projects, and other activities. This is why the teacher's participation in the various aspects of school life should not be looked upon as a burdensome "extra" duty. Such activities can provide certain experiences just as vital as the classroom curriculum.

The force of the group, with its negative as well as positive aspects, exists whether the teacher recognizes it or not. He will find his teaching made easier if he can direct group power into desirable channels, and use it instead of trying to disregard or combat it.⁴

Cultural impact on classroom groups

Teachers who work in suburbia are often faced with a climate of achievement anxiety. School is emphasized by parents and peers; success at a high level has replaced survival as the norm. Students become overly concerned with grades, tense about group standing, and competitive to the point of distrust. Learning tends to become a means to an end; the satisfaction is not in the knowledge gained but in the grade received. Parents put pressure on the child to do well, and on the teacher to see to it that he does.

The importance of achievement is very easy for teachers to overemphasize unwittingly, for what teacher does not want his pupils to learn as much as possible? The danger here is to the child's sense of worth. Those on the low end of any value system tend to feel "out of it." Bright children who are continually overshadowed by brilliant children begin to see themselves as dumb. As competition in the classroom intensifies, for every winner there is a loser, and the discouragement of the "privileged" youngster may equal that of the inner-city child.

This overglorification of achievement, supported as it is by the school, the family, and the community, will not be easy to dissipate or even mitigate. Once such norms are evident, however, they can be discussed with pupils and parents, thinking through implications and alternative motivations, matters of individual differences, aspiration levels, capacities, and the like. Unless this is done, even top-ranking schools can encourage anxieties that result in discouragement, rejection of adult codes, and alienation.⁵

At the other end of the spectrum are the inner city schools, permeated by emotional attitudes which often are more obviously frustrating to the uninitiated teacher. While the atmosphere of alienation in such schools is often seen as a rejection of school by pupils and parents alike, it is more likely based on a lack of meaning in the school experience and a sense of the inevitability of failure. The teacher must begin by laying the groundwork for the opening up of honest feelings. Whenever new experiences and new expectations are introduced, these underlying attitudes will have to be kept in mind. Psychological dropouts start long before compulsory attendance laws permit physical escape.

⁴For a detailed discussion of helpful and harmful group forces in the classroom, see W. C. Morse, "Diagnosing and Guiding Relationships between Group and Individual Class Members," Chapter XI in *The Dynamics of Instructional Groups*, NSSE 59th Yearbook, Part II. (Chicago: National Society for the Study of Education, 1960).

⁵Critical evaluation of value systems in today's schools will be found in *Compulsory Mis-Education* by Paul Goodman (New York: Horizon Press, 1964) and *The Vanishing Adolescent* by E. Z. Friedenberg (Boston: Beacon, 1959).

But recognition of this atmosphere of alienation is only the beginning. It would be folly to assume that any one remedial approach can automatically engender change. If the teacher is going to make school a vital experience for these young people, the work itself must have meaning for them. A curriculum which explains the world and introduces the arts and stories of man will have meaning if it is cast in concrete terms and paced correctly. But curiosity has to be aroused and background filled in. Youngsters must be guided rather than told. Learning for the sake of learning means little to such children. The constant threat of failure encourages few. If they are to externalize their feelings in art and writing, content must be valued over form. The parents of these children, while they may wish that the school would provide help for their children, are likely to expect little, remembering only too vividly their own lack of success in school and the accompanying general disinterest. Yet experience has shown that they are likely to cooperate if contacts are made other than to announce trouble. In fact, inner-city parents in some places are demanding control of their schools to assure responsiveness to their children's needs.

While the image of switchblades, gang fights and police in the halls has enough reality to make one wary, such incidents will be found occasionally in many schools and do not make up the daily routine of every inner-city school. Those who have spent extensive time working with groups of deprived youngsters suggest the following as essential to the teacher who works in such an atmosphere.

1. Knowledge and experience to combat anxiety, frustration, and possible failure. Almost any teacher can learn to work with these people, but a teacher without training and insight will almost necessarily capitulate to the pressures.⁶

2. A clear idea of possible programs. There are now many examples of what has been and can be done.⁷ Careful reading and analysis of reports of such programs will arm the teacher for his own struggles. There are various means of adapting the curriculum. Some designs build in after-school enrichment and ancillary support from specialists.

3. Understanding of the basic psychological elements of such programs. These include the establishment of clear role identification, the beginnings of self-confidence, the encouragement of trust.⁸ Methods of securing parental support are also important.

4. Concentration on adapting these underlying strategies to the situation at hand since, as we have seen, each class has its own individual nature. The age level, make-up, and history of the group will determine what works in a particular case.

The eager young teacher, steeped in the literature of education and charged with expectation, may sometimes forget reality. There will be failures. There is personal tragedy in the lives of these children. This is a problem of cultural

⁶Suggestions will be found in "Adapting Teacher Style to Pupil Differences: Teachers for Disadvantaged Children" by M. L. Goldberg (In J. L. Frost and G. R. Hawkes (Eds.), *The Disadvantaged Child*. Boston: Houghton Mifflin, 1966).

⁷Some interesting sequences used with pupils of junior high school age are described in *Teaching Strategies for the Culturally Disadvantaged* by Hilda Taba and Deborah Elkins (Chicago: Rand McNally, 1966).

⁸Shepard's program in St. Louis, Missouri, is discussed in *Programs for the Educationally Disadvantaged* (U.S. Department of Health, Education, & Welfare, Office of Education Bulletin No. 17 PE-35044).

change. Many of the pupils are multiply handicapped; short cuts and cheap programs are not going to be enough. But the school is still the crucial place to start and the teacher is still the person who can make the most significant contribution, as you saw in the Reading for Chapter 1. The basic goal in these programs is to increase the child's self-esteem.

As school populations become more heterogeneous, the disparity of subgroups within a given classroom becomes more evident. Youngsters who might otherwise never have known each other are thrown together in the classroom group. The American public school offers the greatest intercultural forum the world has ever known. The opportunity for intergroup, intercultural understanding is present in almost every schoolroom.

The teacher can either promote understanding among students or encourage further division by imposing the sometimes rigid standards of his own social caste. A teacher who comes from a middle-class social group may not recognize that among his students are those who come from cultural groups where the goals, habits, value systems, and standards are at some variance with his own. He may condemn a child for swearing, fighting, wearing certain kinds of clothing, or holding particular attitudes about sex without realizing that these behavior patterns are not only accepted but even encouraged within that child's cultural group. He may also fail to see the positive values in a culture other than his own—such as spontaneity, a sense of brotherhood, and a wide capacity for enjoyment. If the teacher is to promote intergroup understanding, he himself needs to appreciate the unique aspects of social subgroups, cultures, and economic classes to which his pupils may belong.

STUDYING SOCIAL PATTERNS IN THE CLASSROOM

Pupils learn about themselves and evolve social roles as a consequence of the way they are responded to in the classroom peer culture. Teachers need to be aware of what is going on, for a pupil struggling for social acceptance or reacting to a group-imposed role may be most difficult to involve in the regular learning experiences. How can a teacher go about studying these matters?

The answer is twofold. One can observe the formal and informal group life of the school. There are also more organized ways in which teachers can analyze the group structure and the roles of the various members. Of course, not every day should be a group examination day. But just as we consider it necessary to assess achievement from time to time, so should we occasionally study group interaction. The knowledge we acquire can give us new insight as we attempt to facilitate group activities.

Before beginning our discussion of ways in which teachers can study classroom groups, it might be well to pause and look at our own experience. All of us have been members of many groups, both in and out of school. Try to answer the following questions:

1. What are some of the ways in which you feel your own life has been influenced by family and peer groups?
2. How would you define your typical present role in peer groups? In classrooms? Does it change? If so, under what influences?

3. What are some of the forms of behavior sanctioned in this particular class? What types of behavior would be disapproved by the group code?

The instructor may wish to organize the class into committees to discuss the third question. In each group one member should serve as an observer, making notes on how the group functions as it goes about the task. At the close of the session, each member answers the following questions:

1. How well did our group function, and to what purpose?
2. What was my role in the group?

The conclusions reached by the various committees and the data on group processes can then be discussed by the class as a whole.

Now let us look at a few of the methods which you as a teacher might use in studying group relationships in the classroom.

Observation

The most common method of studying group interrelationships is observation. Teachers can observe what is going on in the classroom, especially with younger children. By watching children make their choices in games, by observing the spontaneous social contacts they seek out on the playground or in conversational groups, you can begin to see the pattern of their social relationships.

When adolescents are left out of groups, it is apparent; some have no contacts in the informal moments before the class is called to order. Contacts in the hall and in the lunchroom provide other opportunities for observation, as do extracurricular activity groups and class elections.

Particular instances of individual or group behavior may be noted in an anecdotal record and preserved for deeper analysis and comparison with later events. Care should be taken to see that such anecdotes are detailed and completely objective. A log of class activities recording daily experiences can also be of help in interpreting shifts in group interaction.⁹

Sociograms

A more formal analysis of the classroom will reveal information not obvious to the casual observer. With younger children, you might ask each one to indicate on a confidential ballot his first and second choices for those in the class whom he would like to (1) have fun with, (2) work with on a committee, (3) have for a close friend.¹⁰

When you look over the data you have collected, you will find some fascinating things. Suppose you were to make a table in which you weighted each choice

⁹Specific suggestions for using these and other techniques are given in R. Cunningham's classic appraisal, *Understanding Group Behavior of Boys and Girls* (New York: Teachers College, Columbia University, 1951).

¹⁰For further information see E. F. Gardner and G. G. Thompson, *The Syracuse Scales of Social Relations* (Chicago: World Book, 1959) or Mary L. Northway, *A Primer of Sociometry* (Toronto: University of Toronto Press, 1967). A kit for screening all ages is published by Educational Testing Service, 1961.

so that each first choice received two points and each second choice one point. Your class of fifteen might look like this.

Student	Votes Received		Total
	1st choices	2nd choices	
John	8×2	6	22
George	5×2	8	18
Ellen	6×2	6	18
Susan	5×2	5	15
Ralph	5×2	3	13
Mary	4×2	3	11
William	5×2	0	10
Fred	0	6	6
Ruth	2×2	2	6
Marie	1×2	3	5
Jane	2×2	0	4
Sally	1×2	1	3
Tommy	1×2	1	3
David	0	1	1
Peter	0	0	0

You will notice a wide range of acceptance in the group, the top three children receiving almost 45 per cent of the total points while the bottom three receive approximately 3 per cent. One boy receives fourteen first and second choices while another receives no choices at all. It takes little imagination to see how different these children's feelings of acceptance in their group must be. A sociometric diagram of first choices only would give us the visual record on the opposite page. Diagrams for classes of thirty-five and forty would present similar pictures, but with far more complex patterns.

When a teacher makes a sociogram for his class, it is well for him to draw a picture first of the way he thinks it will come out. This procedure will enable him to check his perceptions against those actually held by the group. Bonney (1947) found that teachers tend to overestimate the ratings of children who do outstanding work and are responsive in the classroom and to underestimate those who make a poor academic showing or are unruly.

Bonney's findings indicate that teachers must be wary of their own armchair judgments of the social relationships existing in their classrooms. This is one reason why the more scientific approach to the study of groups is recommended. Even so, the sociogram is not a device to be used freely. Children and adults alike react against being studied and there have been many instances of real upsets resulting from indiscriminate use of such studies. Never go ahead with a sociogram without being confident of your ability to manage and help anyone who may become upset by the study. Adolescents, in particular, are likely to be extremely sensitive; they may also be guarded about expressing their choices.

What can you learn about the children in a group from a diagram of their social relationships? Looking at this sociogram from the viewpoint of a sociometrist, here is what you would find:

1. *Stars* Some children are chosen by many of their associates—John and Ellen, for example. They are thought of as “stars” or central figures and are usually considered to have strong influence in determining the nature of the group.

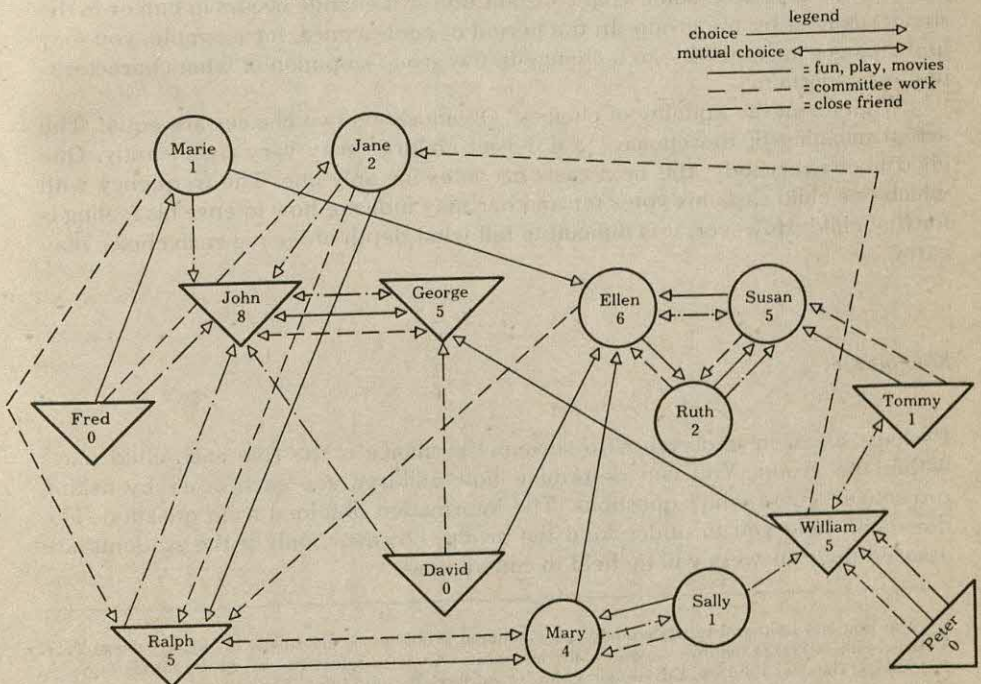
2. *Isolates* Other children, even though they reach out and choose those whom they would like for friends, obtain no intergroup response. They are isolates. Fred, David, and Peter are examples. They received no first choices, although you will recall that Fred has six second choices. Thus, while his response from the group is weak, he still is in the swim of things. Here you see the danger of overvaluing first choices.

Not all isolates handle their own choices the same way. Peter tries to be attached firmly to William. David and Fred spread their choices. Both David and Fred reach out to John for warm human relations, and it may be that John answers their need in some way although the sociogram gives no evidence of this. When you look at John a little later on, you will see how this could be. You might also ask yourself if Fred or David have pals elsewhere or if they are new to the group.

While there are expected individual differences in social interaction, it is frequently true that the isolates are children with personal problems. They may lack a sense of social poise, although they keenly feel the need for friends. They are often puzzled by their aloneness and seek in a variety of ways to overcome it. Sometimes the ways they select only increase their rejection.

A child who receives no choices is not necessarily a withdrawn, nonsocializing individual, however. Many seeming isolates do have social relationships with

SOCIOGRAM OF FIRST CHOICES



age-mates outside of the class. The "isolate" may be well adjusted or he may be shy or he may be maladjusted—facts not shown in the sociogram itself.¹¹

3. *Reciprocals* A sociogram usually shows several mutual choices. John and George are examples. They are obviously buddies. There is also the three-way clique composed of Ellen, Susan, and Ruth, who reserve the majority of their choices for each other. They form a more or less self-sufficient island or in-group. They support each other and may tend to resist outsiders.

4. *Chains* Tommy provides an interesting study. He has only one first choice—from William. Tommy is like a lieutenant, however, with Susan the captain. Susan happens to be just a little headstrong and inclined to defy authority when she feels she is in the right. Tommy is hostile too. He takes his cues from Susan but without her reasonableness and tends toward more or less open displays of negativism. He is an important cog in the social wheel, for he and William are close friends. In some ways William admires Tommy's defiance and tends to imitate it. William has two direct attachments in Peter and Sally. Sally and Mary have a close tie, so in effect Susan's behavior, as reflected by Tommy, plays a significant part in the classroom behavior of William, Peter, Sally, and Mary as well. It is a chain that gathers links throughout the classroom.

By studying this pattern the teacher may learn that the *number* of choices does not always equal the *power* of the group member in actual social relations. There are several questions that should be raised about the meaning of choice itself.

Are choices stable? With young children they tend not to be, but they become increasingly so as children grow older. However, a person's relative position in a group tends to remain somewhat constant unless a change occurs in him or in the standards held by the group. In the period of adolescence, for example, you may find changes in status due to a change in the group's opinion of what characteristics are important.

What about the equality of choices? Obviously no two choices are equal. The actual meaning of the choices to different children may vary significantly. One child likes everybody, the next casts his votes for only one. The frequency with which one child casts his votes for another may indicate how intense his feeling is for that child. However, it is difficult to tell what depth of feeling each choice may carry.

Role quizzes

Perhaps equal in importance to sociometric choice is the role each child plays within the group. You can determine how children see each other by asking projective "guess who" questions. The information obtained from questions like these can help you to understand the group, however, only if the students are assured their answers will be held in confidence.

¹¹A film that can help you to understand the emotional problems of the isolate is *Shyness* (New York: McGraw-Hill, 1953), 23 minutes, sound, black and white. A useful reference will be *Handbook of Social Psychology*, Gardner Lindzey, Ed. (Reading, Mass.: Addison-Wesley, 1954). The sections on sociometrics, social motivation, role theory, and leadership should be especially helpful.

GUESS WHO

1. This is the person I want most to be like.
2. There is one person in our class who is especially good in games and athletics.
3. This person always helps out when anyone has trouble.
4. It makes me feel good just to be with this person.
5. Of all the students in our class, he/she has the best ideas for getting work done.
6. This person has the best sense of humor of anyone in our class. He/she is lots of fun to be with.
7. This person is nice but very quiet and shy.
8. There is one person who is quite nice but he/she is hard to get to know.
9. This student forgets sometimes and borrows things that are not his/hers.
10. There is someone who, although he/she tries hard, can't seem to get the classwork done very well.

Suppose you submitted the questions above to the class analyzed in the sociogram on page 307 and got the results shown below.

Some of the selections represent boy-girl differences—“to be like” for example. Here a boy would not choose a girl. Each child was permitted two votes for each role and in some cases he gave both votes to the same person. In some cases

ROLE SELECTION CHART

	want most to be like	games — athletics	helps everyone	feel good to be with	best for work	fun to be with	nice but shy	hard to know	borrows things	can't do classwork
Peter								1	4	3
David							2	3		
Fred		3					2	2	3	4
Marie						1	1	2	1	
Sally				1			4	3		
Tommy							3			
Ruth						1		1		1
Jane					1		2			
Mary		2	2		2	1	1			
Susan		1	1	1		2			2	
George	1	4		1		1				
Ralph	1		8		10					
William	2	1		2		1				
Ellen	7	2	3	1		5				
John	5	2		8	1	2		1		

the child refrained from voting. None of the children voted for himself for any of the roles.

Notice how clearly visible some roles are. In this instance all the most desirable qualities are attributed to certain individuals and all the least desirable to certain others. Do you think this is an objective selection, or is a "halo effect" involved? What information is missing from this chart that prevents drawing absolute conclusions?

Returning to the sociogram, you will note that John received eight first choices. He has a special role in the group. He is recognized as a warm, outgoing lad by whom both boys and girls desire to be accepted. His role description indicates that he makes people feel comfortable. He was listed in role 4 more often than anyone else. In the sociogram he had only one friendship choice to make, but it stands to reason that he gives friendship to many, perhaps to all. Thus the group, by virtue of his presence, may seem a more friendly one for many of the members.

Ralph is interesting. He has ideas. He is bright. He gets no friendship choices but is seen as a leader for getting tasks done. He was listed by most of the group in roles 3 and 5.

Ellen is the jolly one. She radiates fun and excitement as seen through the eyes of her classmates. She scores high as the one others would "like to be like." She is an ego ideal.

Thus it can be seen that knowing what child will receive many votes and what child will receive few is thin in meaning without a great deal of supplementary information. A teacher needs to study the roles of the different children so that he can see some of the problems they face as members of the group. He may find it necessary to try to encourage democratic action by boys and girls who are central figures in the group so that their social leadership will be the type from which all may benefit.

An individual's role determines his position on the social totem pole of the class and is closely related to his classroom behavior. In one study of seven hundred adolescents (mean age 14.6 years) it was found that those least accepted in their group admitted to pressing personal problems, including great concern about their social skills, personal unhappiness, family difficulties, and a dislike of school (Kuhlen and Bretsch, 1947). For such pupils, status problems and other personal concerns may be such a drain on attention and energy that little of either is left for academic learning.

Peer leadership is often more effective than adult leadership in working the isolate into the group and getting the group to accept him, but this procedure cannot be applied wholesale. Differences in adult leaders, the group, peer leaders, and the isolate's problem make each case an instance for individual study.

An interesting study was carried out many years ago in Germany on the extent to which the group's like or dislike of a person regulates the group's opinion of his skill in performance. Two subgroups were selected from a class. Group A was comprised of those universally liked by classmates, group B of those who were disliked. Unknown to the class, group A was trained to make mistakes in a performance for the class while group B was trained to perform perfectly. However, the class still judged A as performing correctly and B as making mistakes (Zillig, 1928). This study indicates that the individual's class contribution,

regardless of its correctness, is judged by the group in relation to his group status.¹²

Another important study was made by Rosenthal and Cofer (1948). These men placed a "plant" in particular groups. The function of the "plant" was to display indifference and negativism toward the task at hand, yet to behave in such a way that he did not become an isolate. His achievement at the task was kept average for the group. Every group with a "plant" showed disintegration in motivation and cohesion.

Teachers are well aware of this phenomenon in the classroom. They are often confronted with a student who drags group purposes into confusion and breaks down morale. Not until the teacher is aware of the purpose behind such behavior will he be able to cope with it effectively. What the student is attempting to accomplish by his actions usually provides the best key to how the situation should be handled. If it is possible to fulfill the unsatisfied need or to create a situation in which the student's purposes can be achieved constructively, the problem becomes less difficult. In serious cases the help of a specialist may be needed.

Other group study devices

The social structure of the classroom may be assessed in a variety of other ways. Some of these have been referred to in Chapter 1. The University of Michigan's Center for Research on Utilization of Scientific Knowledge is a source of tools for the classroom teacher.¹³ For the most part, these take the form of questionnaires. They include procedures for determining the views of the class and the teacher, the social relationships, and the nature of the pupil-teacher interaction as well as outside influences on school performance.

Special attention is given to ascertaining classroom norms. For example, responses to items such as the following are to be indicated on five-point scales from "agree almost always" to "disagree almost always."

1. It is good to take part as much as possible in classroom work.
2. Asking the teacher for help is a good thing to do.

Thus a group distribution allows for general feedback and both individual pupils and the teacher can compare their views with those of the group as a whole. Variations for use with older and younger pupils are suggested.

GROUPING FOR INSTRUCTION

The problem of grouping in school organization has long involved educational planners and researchers. Should pupils be grouped into classes according to

¹²For a complete study see "Socialization and Social Structure in the Classroom" by Glidewell and others in Hoffman, L. W., and Hoffman, M. L. *Review of Child Development Research*, Vol. 2 (New York: Russell Sage Foundation, 1966).

¹³Details are given in Teacher Resource Booklets prepared at the Center and published by Science Research Associates, Chicago, Ill. Two of these are: *Diagnosing Classroom Learning Environments* by R. Fox, M. B. Luski, and R. Schmuck (1966) and *Problem Solving to Improve Classroom Learning* by R. Schmuck, M. Chesler, and R. Lippitt (1966). For an observational schedule, see "The Assessment of Classroom Emotional Climate by Means of the Observational Schedule and Record" by I. J. Gordon (*Journal of Teacher Education*, 1966, 17, 224-232).

ability? If so, what characteristics should be the basis for grouping? Should we group differently for different subjects? What is the optimum class size? Studies attempting to answer these questions show equivocal results.¹⁴

Size is one variant

It is obvious that some children at some tasks need more teacher attention than can be given in a large class. The schools will need to be inventive in variation, using larger groups where motivation is high and progress easy, to allow higher teacher investment per pupil in classes where half the usual size may be needed.

Why are there no clear answers to class size or grouping variables? Probably for many reasons. The authors of one large-scale study of ability grouping concluded that "it could not be shown that the amount they gained in a year of mathematics or language depended to any significant extent upon the variability of the sections in which they were taught." (Millman and Johnson, 1964, p. 51) But these authors point out that there is no evidence of specifically designed programs or curriculum modifications in the classes studied.¹⁵ Administrative devices in themselves are hollow. Perhaps, as has been suggested, the "middle" pupils often fare better because the whole classroom process is oriented toward the mean (Antes and DeVault, 1965).

It is difficult to control important factors adequately, and there are a vast number of variables. Separating the bright students from the less able sometimes is opposed as "undemocratic." No one has yet used motivational level or aspirational level for grouping, and yet these might well be the most important variables. Since each pupil learns by himself at his own rate, the force of individual differences will be operating within any classroom group.

Even the size of the school itself has been a subject of research. In an examination of high schools ranging from 35 to somewhat short of 3000 pupils, it was found that the participation rate and spirit were higher in small schools, "small" being defined as small enough that the pupils are needed in the conduct of the various activities (Barker and Gump, 1964). This suggests that, whatever the size of the group in question, it should be designed to enhance participation.

A teacher can prepare only so many individual lessons. He has only so much time to distribute among the pupils. The larger the group, the slower a given pupil's turn comes around. Yet to the extent we attempt to teach one uniform experience to all, we are abdicating our responsibility. How, then, can we group children without suppressing individuality?

One method being studied is elimination of the horizontal, fixed-rate procedure of one year, one grade. In ungraded elementary schools, a group often stays with the same teacher for three years, and pupils move at their own pace within the group. But no procedure will in and of itself produce differential gains: it

¹⁴An international volume in which many experts including Olson, Thelen, and Vernon discuss this issue is: Yates, Alfred (Ed.), *Grouping in Education* (New York: Wiley, 1966). Several experiments in grouping—with somewhat inconsistent results—are described by R. B. Ekstrom in *Experimental Studies of Homogeneous Grouping: A Critical Review* (Princeton, N.J.: Educational Testing Service, 1961).

¹⁵For further studies of ability grouping, see C. W. Harris, (Ed.), *Encyclopedia of Educational Research*, (New York: Macmillan, 1960), and W. R. Borg, *Ability Grouping in the Public Schools* (Madison, Wis.: Dembar Educational Research Service, 1966).

depends upon *how* it actually sets the learning format for the individual pupils. For example, in one study an ungraded program was found to be neither inferior nor superior in any of the following: achievement, teacher satisfaction, or sociometric patterns (Hopkins, Oldridge, and Williamson, 1965). But there might have been differences in attitude or other variables which were not revealed. We need to know more about how it functioned to sort out the potentials of the design.¹⁶

Flexible grouping, team teaching, and peer-to-peer teaching make possible a variety of teaching arrangements. A familiar pattern in junior high schools is combining such subjects as science and math or English and social studies for longer time blocks as core classes. Social relationships may be enhanced (Forlano, 1964), but again it would depend upon the type of teaching and many variables in addition to the time arrangement. Whether related subjects are better learned in this way is an open question.

One recent innovation is for peers to help each other or for older pupils to help younger ones by serving as tutors, just as adult teacher aides can do. The purpose of these "groups of two" is to provide more teaching investment and direct feedback from someone who can prevent the perpetuation of errors. Furthermore, the practice often proves beneficial to the tutor as well as to the individual being tutored.

Another concept is that of the unscheduled high school. Less time is spent in formal classes. More is available for independent study and small-group conferences with the teachers. Pupils may take additional units and more difficult work if they are able. Needless to say, such procedures will have to include intensified counseling and support for the many students who work only under pressure until they are helped to find motivation commensurate with their abilities and talents.

It is now an accepted practice to work with the seriously handicapped outside of the regular classroom where community resources make this possible. By *seriously handicapped* is meant the dull, the emotionally and socially disturbed, and those who are physically limited to such a degree that a regular classroom is impractical for them.¹⁷ Recent attention has been focused, too, on the needs of the brighter students for an optimal learning situation through acceleration, enrichment, and other special programs.

Many school systems with small enrollments are able to provide special programs for these groups with special potentialities and special problems only by banding together into broad geographical units. Even when numbers would warrant special classes, the cost may be a problem. Yet without more intensive adult help, the brighter pupils languish, and the dull and disturbed are likely to become prime problems in management.

But setting up special classes for the very different only whittles away at the edges of the problem. As you saw in Chapter 1, even a so-called normal grade group contains a range of several years in mental age and an even wider range in achievement. In ability, in experience, and in emotional and social maturity there

¹⁶For a fuller discussion of the concept of nongraded schools, see *The Non-graded Elementary School*, by J. J. Goodlad and R. H. Anderson (New York: Harcourt, Brace & World, 1959), and *The Non-graded High School* by B. F. Brown (Englewood Cliffs, N.J.: Prentice-Hall, 1963).

¹⁷The special problems and some of the provisions being made for the education of children with various kinds of handicaps are described in *Education of Exceptional Children and Youth*, edited by W. M. Cruikshank and G. O. Johnson (Englewood Cliffs, N.J.: Prentice-Hall, 1967).

are wide variations, and the child with highest ability may not be the one who has had the richest experience or is most mature.¹⁸

As we have seen, the public assumes that divergency can be decreased through teaching, whereas the longer children are exposed to learning opportunities, the more different they become. Only by stringent rationing and withholding could the able and highly motivated pupils be kept from surging ahead of those on the lower borderline, and no responsible educator would suggest such measures. The problem posed by individual differences is not solved by trying to eliminate the differences but by maximizing the opportunity for each child to develop and use what potentials he has. This means special study of each area of teaching and each classroom group.

To provide for individual differences, the teacher first decides how much of a common core of achievement his subject or class demands. In some classes—for example, in certain sequential mathematics or language courses—the common requirements for passing the course may be very high. In other courses there may be fewer demands that everyone has to meet in exactly the same way, step by step. There is more latitude in art, in shop, in certain social studies or English classes.

Once a teacher sets the common core demands, it becomes possible, both through grouping and through provision for independent work, to maximize the allowance for individual differences. Science classes can include, in addition to the text and experiments for all, a portion of self-chosen, at-one's-own-level projects. All the members of the English class need not read exactly the same books. And so it goes.

To foster individual effort on the part of each pupil under a diversified course plan requires stimulation, help, and often counseling from the teacher. Some pupils are anxious if everyone is not following the same pattern. Those with special ability are not always eager to put in special effort. No teacher should expect to accommodate to all the facets of this problem of differences.

One pitfall to guard against in grouping for instruction is the creation of a "rejected" group. Such a situation can result if all grouping is based on one factor alone, such as reading ability or mental age. It can be avoided if grouping changes throughout the day's program and if the child is shifted from one group to another as his achievement and his needs change. The child who is slow in learning to read may be strong in arithmetic or have unusual artistic ability. The apathetic child who shows a sudden spurt of enthusiasm may have his awakening interest sustained by a more challenging group. Flexibility is the keynote in grouping for instruction.

There is yet another aspect to grouping within the classroom. Much of the young person's liking for school depends upon the friends he has there and the opportunities he has to be with them. The feedback he gets from his associates can enhance his personal status or lower it, and hence can make him feel secure or anxious. Because of his overriding need for social acceptance, a pupil is likely to give first attention and interest to activities involving his social relationships

¹⁸An interesting dialog on the subject of homogeneity in the classroom appears in the Autumn 1966 issue of the *Journal of School Psychology*. See "The Fallacy of Homogeneity" by T. A. Chandler and "Some Fallacies in 'The Fallacy of Homogeneity'" by W. R. Borg.

rather than to the content of the lesson. Experiences resulting from social situations are the ones most apt to leave permanent and cumulative effects.

Youngsters need to feel secure in their group relations at school. When they are insecure, it is difficult for them to concentrate on the academic learning they are expected to accomplish. Traditionally the teacher has often tried to keep friends apart in an effort to reduce possibilities for socializing. But studies show that pupils produce more when they work with those who accept them (Schachter et al., 1953). The wise teacher will recognize this and will both permit and encourage children to work in groups where they are socially at ease. In general, those who are succeeding in social relationships are also the ones who are succeeding in schoolwork.¹⁹

Considerate grouping of individuals within the larger group of the classroom is of prime importance in giving each person the self-respect and sense of belonging that he needs. A useful way to determine desirable grouping is to ask pupils to express choices for seating and committee associates. Jennings (1950, p. 206) stresses the importance of making sure everyone is provided with some of his first choices. At the same time, however, attempts should be made to bridge cleavages due to minorities, economic differences, or other factors.²⁰

Choice grouping for specific tasks is highly effective in the elementary classroom. It may be more difficult to carry out in the secondary school, but even there the teacher can see that work groups include pupils who will feel comfortable together and benefit from each other's company.

The issue is clear. While we will be teaching groups, and there are many positive learnings possible only from the group life itself, we must make every attempt to individualize each student's "private class" within the schoolroom. This means careful attention to methods, including amount and distribution of pupil contact, content, evaluative expectations, and rate of progress. It even means at times "nongrouping" for learning. Individual study, teaching machines, and carrels provide the "insulation" some youngsters need.²¹

When individual pupils do not fit into the class group or disrupt group activities, counseling of the individual may be needed before the group processes can proceed more smoothly. Talking it over with the teacher sometimes helps the isolate reduce the effect of a trait or condition that is holding him apart.²² Sometimes the teacher has to stretch his imagination to create activities that will bring isolates into the group, but with shy, withdrawn children, continuous unobtrusive effort is needed.

The teacher's own acceptance of rejected youngsters may serve to initiate acceptance by the group if the teacher himself is generally accepted. He may help

¹⁹The importance of the classroom social climate is discussed by J. A. Antes and D. M. DeVault in "Elementary Pupils' Perceptions of the Socio-Emotional Environment of the Classroom" (*Psychology in the Schools*, 1965, 2, 41-46) and by R. Schmuck in "Some Aspects of Classroom Social Climate" (*Psychology in the Schools*, 1966, 3, 59-65).

²⁰Some of the possibilities and limitations in using seating arrangements to foster social relationships are discussed by M. A. Dineen and R. Garry in "Effect of Sociometric Seating on a Classroom Cleavage" (*Elementary School Journal*, 1956, 56, 358-362).

²¹Individualizing Instruction is the topic of the N.S.S.E. 61st Yearbook, Part I, edited by N. B. Henry (Chicago: National Society for the Study of Education, 1962). See especially Chapters 11 through 14.

²²The capacity of a youngster to evoke what he needs from a group is discussed in "The Child As a Determinant of His Peers' Approach to Him" by M. Kohn (*Journal of Genetic Psychology*, 1966, 109, 91-100).



Working together in small groups, children learn far more than the facts of the curriculum. Skills of co-operation, of getting along together, of doing one's share, are learnings that come only in such a setting. Giving consideration to the pupils' choices of working companions helps to ensure a pleasant atmosphere for the learning of group skills.

the group to respect contributions made by other than the chosen few and thus begin a shifting of roles within the group.

Sometimes a teacher himself is the source of negative group forces. Because of the teacher's attitude, a particular pupil may be designated as the class scapegoat and thus bear the brunt of jokes, criticism, and hostility by the entire class. Of all group shortcomings, this is the one most within the teacher's power to change.

SOLVING GROUP PROBLEMS

Many classroom problems can be traced to inappropriate methods or curriculum and can be overcome by adaptations to suit the needs of the class. In other cases, however, the root of a problem lies with the group itself.²³ Or it may be the roles played by individual pupils, which we shall discuss in a later chapter.

Methods of working out problems in the group itself range from open discussion of school in general or the group in particular to subtle efforts to influence cliques or help youngsters find friends. In one junior-high classroom, group members were openly rebellious and antagonistic. They did little work and much complaining. The school psychologist held a series of discussions with the class. At first, these centered around resentment against the teacher who "grades too hard," "uses words we don't even know," and "doesn't like us." As time went on, more basic issues came to light. They felt they were a class of rejects, having acquired such a bad reputation in earlier grades that no one even tried to help them any more. They felt they were "dumb" and "mixed up" and had been given

²³See "Resolving Classroom Tensions: A Group Approach" by B. Feder (*Psychology in the Schools*, 1967, 4, 36-40).

up. A great deal of discussion, in committees and on an individual basis, was necessary before there was some degree of relaxation and a real effort to solve their problems. This group never became an ideal class, but its members eventually learned to examine their behavior in depth. Application and evaluation never came easily, but considerable improvement was made, primarily through the teacher's increased insight.

One basic positive aspect of group discussion was revealed by Lewin (1943) in his pioneer studies on group decision making. He found that open group discussion leads to decisions which are more binding on the members than individually made or arbitrarily requested behavior decisions.²⁴ Thus, when a group decides that a given topic should be studied, there is greater motivation than if the same assignment is made by the teacher. This type of group decision making can often be of great help to the teacher.

Again, the Center for Research on Utilization of Scientific Knowledge offers direct help for the teacher (Schmuck, Chesler, and Lippitt, 1966). Once a diagnosis is made, the classroom difficulty can be approached from the point of view of problem solving. Some of the specific plans suggested in this study are presented in the chart on page 318.

An excellent way of gaining insight into group problems is through role playing. Pupils easily become acclimated to "acting out" certain situations, taking various roles and looking at motivations and solutions. Reenactment with another cast frequently follows the first effort. In the discussion that follows, the observers bring out differing opinions and interpretations. It is important that the teacher become thoroughly acquainted with this method of "social teaching" before trying to use it. Both the selection of a scene to be portrayed and the assignment of roles must be handled carefully. As Chesler and Fox (1966) state, role playing provides a dramatic confrontation of social relationships, expectations, and life style. Incidentally, this method is also a most effective way of teaching social studies.

Often there is a need to develop some insulation from group pressures for the individual pupil. Since groups tend to demand conformity for acceptance, there is a huge problem in providing "breathing space" for individuals rather than a stifling adherence to group codes which condemn exercise of legitimate differences. While one major function of the educational establishment is to cultivate a certain degree of conformity, we are often less aware of the need for individuals to follow their own bent when it is not harmful to others or in violation of basic societal sanctions. This requires direct tutelage of groups to accept others who are "different" as well as those who are like themselves. By both precept and example, an instructor can make pupils aware of the meaning of "acceptable though different." Frank discussion of these differences in a spirit of rights reduces the negative implications. Such discussions get to the heart of the democratic group life—everyone is entitled to his own opinion so long as it does not reduce the opportunities for others. Group solidarity can be based on differences rather than on similarities. The right to dissent can be built into the classroom activities. The classroom group which does not care about the members as persons will spawn a whole series of related problems. Acceptance of one another is the starting point of healthy relationships.

²⁴This is apparently especially true when the decisions involve the taking of risks, which could apply to both delinquent and socially courageous acts (Wallach, Kogan and Bem, 1962).

IMPLICATIONS FROM RESEARCH FINDINGS

1. Need to experience a positive relationship with a teacher.
2. Change in values of self and of competence needs to precede acceptance of school subjects.
3. Project-oriented school experiences are most likely to provide necessary success in initial approach with academic work.
4. Need acceptance by, and integration into, the socialized peer culture.
5. Individual values and norms are best modified by proteacher, proschool peers.
6. Work with parents on relations with the child and the school should result in improved school adjustment of the child.
7. Work with child on relations with parents should improve school adjustment.
8. Rewarding contacts with community authority figures should yield improved school adjustment.
9. Interesting projects need to be planned providing basic skill practice and success experience for self-reevaluation.
10. Continuity of regular school program should be maintained.
11. Multiple-entry approach of programing in several areas should be applied.

ACTION DESIGN FOR IMPLEMENTATION

1. Special classroom
 - 8 students together for a half day
 - focus on academic fundamentals and behavioral interaction
 - weekly training consultant for teacher
2. Visiting teacher
 - meets weekly with each child
 - meets weekly with parents of child
3. Regular classroom human relations training
 - consultant - demonstrator works in same classroom
 - teachers and consultant meet weekly as a resource team on problem solving and developing classroom innovations
4. Afterschool activities clubs
 - antischool students with proschool peers
 - consultant - demonstrator leads some clubs
 - consultant meets weekly with adult leader
5. Child in regular school program half day
6. Case conferences
 - semimonthly for involved school staff and clinicians
7. Policy committee meetings
 - annual meeting for evaluative reporting and policy review
 All seven above
8. Evaluation team
 - action-research team relates to program personnel as indicated above
 - conducts data analysis and reports results

Another problem that arises in the classroom is that the group itself can serve as a distraction. The child who is easily upset or who pays attention to every movement of his peers and the slightest outside noise needs to be protected. Physical arrangements which reduce visual distractions, subgroupings made by moving tables and chairs, are more effective than continual admonitions to be quiet and get to work, which only distract the rest of the class. How and where the teacher moves about the room is also important. The sight of a flow of pupils to a desk in front of the room may encourage others to make similar trips. In some groups the desk might better be at the back of the room.

THE TEACHER AS CLASSROOM GROUP LEADER

Like the president of a club, the teacher of a classroom helps his group to define its goals and to achieve those goals. Yet the teacher as a group leader differs from a club president. Club members elect their own president. They limit their leader's authority and specify his responsibilities. Pupils do none of these things. The teacher is appointed by the community through the school board. The community grants and limits his authority and specifies his responsibilities. Thus the teacher is vested with a cloak of authority.²⁵

But the authority role of adults in our culture as a whole is growing less and less. Few parents today demand or expect unquestioning obedience. Indeed, many find it difficult or impossible to establish any adequate authority role. These changing patterns of child-adult relationships are reflected in the classroom.²⁶ Classmates are invested with prerogatives and power once reserved more exclusively for adults, and adults who try to compete with peer pressures often come off second best.

This change in the adult authority role does not mean that the teacher serves a less important function than in the days when being an adult carried with it the expectation of automatically being believed and obeyed. It does mean that most teachers today work in a different atmosphere.

One type of teacher concentrates first on subject matter and second on how the individual child relates to him. Pupil-pupil relationships and group-teacher relationships finish a poor third in his classroom. He suppresses or holds a tight rein on the expression of group feeling since it often produces behavior difficult to handle.

But the pupil exists in another world. He is primarily interested in the social relationships in the classroom, especially his relations with his classmates. He devotes most of his energy to managing his social relations, giving to curriculum learning whatever energy he has left. The teacher's hierarchy of what is important and the pupil's hierarchy may thus be completely reversed.

²⁵Two studies of leadership in the classroom are "Dimensions of Leadership Behavior in Classroom Discussion Groups" by C. J. Bartlett (*Journal of Educational Psychology*, 1959, 50, 280-284), which explores the leadership qualities of students within a group, and "Teacher Competence and Pupil Change" by W. I. Ackerman (*Harvard Educational Review*, 1954, 24, 273-289), which considers the teacher's leadership role.

²⁶D. P. Ausubel, an authority on the adolescent period, feels that for adequate assimilation of values, a child needs to become *satellized*—to experience not only love and acceptance but also a relationship of dependency on parental figures. He has found that children who remain *unsatellized* through lack of an adequate authority relationship tend to show serious problems in preadolescence and adolescence. See his *Theory and Problems of Adolescent Development* (New York: Grune and Stratton, 1954).

The modern teacher tries to balance these three aspects of classroom life and to interweave them. He does not think of them as separate items but as intertwined strands of a single purpose. At one time he may emphasize subject matter, at another time the teacher-pupil relationship, at another time the relations among class members, depending upon the particular situation or the goals of the course. He recognizes the power of group forces and tries to make them constructive forces in the lives of his pupils. Often he can harness them in the service of academic learning.

Although the authority that the community confers on teachers may sometimes seem lacking in substance, it is still the teacher who sets the tone of the classroom. Whether by careful effort or by default, it is he who is most responsible for determining the psychological climate to which students must respond. Quite different learning will result depending on whether his leadership is supportive or repressive, integrative or punitive.²⁷

The methods a leader uses depend partly on the larger setting in which he is operating—its expectations and values—and partly on his own evaluation of the most effective way to achieve the particular goals toward which the group is working. Several types of leadership roles have been identified by researchers in this field.

A well-organized formulation of leadership methods, which describes typical teacher leadership patterns, is that of Knickerbocker (1948). He specifies four methods by which group leaders define and attain group goals:

1. *Force* as a method implies leader control of both the goals and the means. Teachers of this type dominate the whole classroom, make all the decisions, and demand unquestioning obedience.

2. *Bargaining* involves either obvious or subtle indications of the exchange of one favor for another. This approach allows members more control over group affairs than the force method does. You may have had a teacher who would promise to give no test if the class did good work—or make other such bargains.

3. *Paternalism* implies a type of bargaining in which gratitude is expected by the leader as a reward for the things he does. Here we have the teacher who takes any resistance personally and expects pupils to do well “for me.” This type of teacher is likely to react with hurt feelings when things do not go right “after all I’ve done for you.”

4. The method of *mutual goals and means* implies the use of discussion, cooperation, and consultation on the part of leader and members to identify common goals and to determine methods of achievement. This method centers on the conviction that goals mutually agreed upon and mutually carried out are more effective and meaningful than those arbitrarily defined and executed from above. For the teacher, the important thing is to know what decisions are appropriate for sharing and what ones are not. Without such discrimination, the teacher using this style of leadership would forfeit the necessary adult authority.

²⁷For a classic study comparing the pupil behavior found in classrooms with integrative and domineering teachers, see “Studies of Teachers’ Classroom Personalities” by H. H. Anderson and J. E. Brewer (*Applied Psychology Monographs*, 1946, No. 8). Observations were made at the second-grade, fourth-grade, and sixth-grade levels; in each case it was found that children with integrative teachers showed more integrative, appreciative, and socially constructive behavior, whereas those with domineering teachers showed more signs of tension and conflict.

Leadership may also be viewed in terms of the social climate it creates. This point of view was investigated by Kurt Lewin, Ronald Lippitt, and Ralph K. White of the University of Iowa (White and Lippitt, 1960). By social climate is meant the prevailing atmosphere within which the group functions. This atmosphere is in turn responsible for the feelings of comfort or discomfort which the group members have about themselves, each other, their leader, and the group's goals and purposes.

In a series of studies by these men three basic types of group leadership were defined: autocratic, democratic, and laissez-faire.

TYPES OF LEADERSHIP

Autocratic leader	Democratic leader	Laissez-faire leader
dominates—directs	shares control with members	operates as "observer"
decides all issues	asks for contributions	makes no attempt to
encourages no participation	makes objective criticisms	regulate or orient
in planning or control by	encourages group initiative	allows complete member
members	delegates responsibility	freedom
makes personal criticisms	participates in activity	no restrictions imposed on
assumes all responsibility	has close relationships with	members
maintains wide social	members	no clear goals established
distance from members	works for mutual establish-	allows complete nonparti-
defines goals, imposes them	ment of goals	cipation
on members		no participation of leader
initiates all activity		with group

The *autocratic* leader dictates and others follow. A person assuming this role has little faith in the ability of group members to act responsibly. The goal here is action for visible and immediate accomplishment of some end defined by the leader. Techniques of reward and punishment become necessary, for members will not usually find self-satisfaction in a goal they have not selected. In this type of social climate members become dependent upon the leader, for they have no opportunity to express initiative, creativity, or responsibility. Without its leader the group is likely to fall apart.

The natural result of the stifling of personal freedom in any situation is hostility, resentment, and anxiety. Yet in an autocratic atmosphere such negative feelings must remain unexpressed. The need for vengeance shows itself in devious ways. Since hostility cannot safely be directed at the leader, a scapegoat frequently is sought. Group members can then vent their resentment on a "safe" target, one from whom they do not fear retaliation.

A group functioning in this type of climate usually has the most immediate and visible products to show for its efforts. But the members have little interest in the fruits of their labor and work only as long as they have to.

The *democratic* leader creates an atmosphere allowing for the mutual sharing of responsibility. He helps to provide a sense of direction for the group and encourages group participation. This type of leadership affords the greatest expression of individual differences because no one opinion is considered ultimate and final. It is most effective in determining policy and the members achieve the most learning in the sense of behavioral change. They are able to initiate activity,

and they learn to carry individual responsibility. Should the leader be called away they can carry on efficiently in his absence. There is high personal interest in group goals. The atmosphere is cooperative and friendly.

The *laissez-faire* leader leaves the group wholly on its own to create its own sense of direction. Such a climate results in little work output, not because of a lack of freedom but because of a lack of cooperation. The emphasis is upon the enjoyment of group activity, rather than upon production or behavior change. Consequently, there is little personal involvement or concern with a goal.

People trained under autocratic, forceful leadership learn, among other things, to need such leadership. They come to feel themselves incapable of handling freedom and responsibility. They do not have the security necessary to make decisions and are lost without well-defined and prescribed directions. People can quickly be taught to follow autocratic leadership because fear is usually employed.

A democratic, mutual-goals-and-means pattern is not so easily learned. It must be experienced and slowly assimilated into each person's behavior because its very nature rules out force as a tool for implementation. It must be learned through living and through freedom of choice. Thus democratic leaders placed over groups of people brought up under autocratic regimes cannot expect them to assimilate democratic principles immediately. Training for democracy is a long and arduous task demanding real conviction and patience on the part of the leader.

Cunningham et al. (1951) examined leadership specifically as it applies to the teacher. They discovered that teachers employed five general "patterns of interaction." They were: (1) adult rule, pupil obedience; (2) planless catch-as-catch-can control; (3) teacher planning with individuals; (4) adult-directed group planning; and (5) group self-management through group planning.

Under *adult rule, pupil obedience* the teacher assumed absolute authority and expected his pupils to act accordingly. This pattern gave rise to both docile obedience and open hostility on the part of the group. In middle-class schools the autocratic teacher is seen to direct pupil hostility against peers; in lower-class schools hostility becomes directed toward the teacher (Henry, 1955).

Under *planless catch-as-catch-can control* no attempt was made by the teacher to organize or control the group. In the few instances when this pattern was found, it resulted in confusion, insecurity, and competition on the part of the group members.

Under *teacher planning with individuals* each student had an opportunity to plan a personal program of study with the teacher. This pattern was usually employed by teachers who believed they were being democratic yet applied the first pattern as their overall plan of interaction. Some groups reacted well to this procedure, particularly when rapport with the teacher was high.

Under *adult-directed group planning* the teacher allowed for group planning and interaction in the direction and within limits he himself had set. Group reaction depended upon the insight of the teacher in pacing the program to the level of the group. Where it was too high, the group was insecure; where it was too low, the pattern tended toward adult rule.

Under *self-management through group planning* the group developed its own goals, planned, achieved, and evaluated them cooperatively with the teacher acting as a member of the group.

Many studies strongly suggest that the goals of education outlined earlier in this book are most likely to be achieved in a democratic climate. Yet pupils seem to react more to a teacher's emotional balance than they do to the particular method he is consciously trying to employ. There is bound to be trouble when a teacher behaves in a fashion out of tune with his own feeling of security. For example, it is upsetting for a teacher to give his students more freedom than he himself is emotionally ready to accept. Nothing is more painful than to observe a compulsive teacher trying to act at ease while his pupils meander through a planning session or become wild and noisy in their play. At the other extreme, you will find teachers so opposed to authority, so identified with the child against coercions of the culture, that they cannot be at ease enforcing even a minimum of structure.

Although it is more difficult to exercise authority today than it was in previous generations, it is no less important that students see in their teachers the stabilizing influence of a mature, secure, and purposeful leader rather than a fearful, punitive, or compulsive adult. There is a significant difference between the leader who acts *with authority* to help the group deploy its resources to the best advantage and the one who acts compulsively in a highly *authoritarian* manner at every opportunity. The authoritarian personality tends to dominate and restrict those who are under him while at the same time he is subservient to superior authority figures. He follows this demanding regimen whether or not the group has the capacity for a higher degree of self-management. There is often a deep neurotic background to this type of domination of others.

This deeper personal ramification was first presented in Chapter 1 where the basic values of the teacher as a person were discussed. This becomes very important here. Redl (1966) has analyzed the different styles of teacher-pupil relationships which are produced by varying leadership needs in a somewhat different way. While he has ten subtypes, his major categories are three.

1. The leader as the *object of identification* either on the basis of love or fear.
2. The leader as the *object of drives*, again love or aggression.
3. The leader as a *source of ego support*.

Probably we are never just one thing or another to an individual or a class; an awareness of the depth of the teaching role is humbling and a little frightening. But the important thing about leadership tactics is to select those in keeping with one's goals and the group's present capacity to function. A teacher may want to "be democratic," yet his pupils may need a strong adult decision maker until they have learned how to assume more responsibility. On one hand, every teacher has a philosophic predisposition regarding the way he wishes to function as a leader; on the other hand, a teacher must begin at the point where the class is and gradually move toward the point where he wishes them to be. Too often teachers will take a class with little or no capacity for self-management and never do anything to teach them how to function. (This seems to be especially true in high schools.) This is why skill in diagnosing groups becomes a most vital prelude to selecting the leadership stance which is appropriate to the class at any given time.

There is no list of "tried and true" rules for the group aspects of teaching. Rather this chapter has indicated that all teachers are social psychologists, able or ineffective. The road to effective practice is through a thorough appreciation of the power of group forces.

RESPONSE TO PRESSURE FROM PEERS VERSUS ADULTS AMONG SOVIET AND AMERICAN SCHOOL CHILDREN

In this chapter we have read of the ways in which school children are influenced by the peer culture. The authors of this international study have investigated peer influences in other societies and have come up with some very interesting results. In the article presented here they discuss the relationship between peer pressure and adult standards. What do you think might be some of the factors in American life that account for the findings reported here?

Problem

The experiment to be reported here is part of a more extensive research project investigating the differential impact of adults and peers on the behavior and personality development of children in different cultural contexts. Our earlier studies had pointed to important differences from culture to culture in the part taken by peers *vis-a-vis* adults in the socialization process. For example, in Germany the family appears to play a more central and exclusive role in upbringing than it does in the United States, where children spend a substantially greater proportion of their time outside the family in peer group settings (Devereux, Bronfenbrenner, and Suci, 1960). The influence of peers emerged as even stronger, however, among English children, who were far more ready than their American age mates to follow the lead of their companions in socially disapproved activities rather than adhere to values and behaviors approved by parents and other adults (Devereux, Bronfenbrenner, and Rodgers, 1965). In other words, the evidence suggested that in both countries—and especially in England—peers often stood in opposition to adults in influencing the child to engage in anti-social behavior.

In contrast, field observations in the Soviet Union (Bronfenbrenner, 1963) indicated a rather different pattern. In that country, in keeping with the educational principles and methods developed by Makarenko (1952) and others, an explicit effort is made to utilize the peer group as an agent for socializing the child and bringing about an identification with the values of the adult society (Bronfenbrenner, 1962b). Accordingly we were led to the hypothesis that in the Soviet Union, in contrast to America or England, children are less likely to experience peer pressure as conflicting with adult values and hence can identify more strongly with adult standards for behavior.

Research design and procedures

An opportunity to investigate this hypothesis was provided during the author's visits as an exchange scientist at the Institute of Psychology in Moscow in 1963 and 1964. With the cooperation of Soviet colleagues, it was possible to carry out a comparative study of reaction to pressure from peers *vs.* adults in six American ($N=158$) and six Soviet ($N=188$) classrooms at comparable age and grade levels (average age of 12 years in both countries, 6th graders in US, 5th graders in USSR, where school entrance occurs one year later). To measure the child's responsiveness to pressure from adult *vs.* peers we employed the following experimental procedure. Children were asked to respond to a series of conflict situations under three different conditions: 1) a *base* or *neutral* condition, in which they were told that no one would see their responses except the investigators conducting the research; 2) an *adult* condition in which they were informed that the responses of everyone in the class would be posted on a chart and shown to parents and teachers at a special meeting scheduled for the following week; and 3) a *peer* condition, in which the children were notified that the chart would be prepared and shown a week later to the class itself. The conflict situations consisted of 30 hypothetical dilemmas such as the following:

The lost test

You and your friends accidentally find a sheet of paper which the teacher must have lost. On this sheet are the questions and answers for a quiz that you are going to have tomorrow. Some of the kids suggest that you not say anything to the teacher about it, so that all of you can get better marks. What would you really do?

Suppose your friends decide to go ahead. Would you go along with them or refuse?

REFUSE TO GO ALONG WITH MY FRIENDS			GO ALONG WITH MY FRIENDS		
absolutely certain	fairly certain	I guess so	I guess so	fairly certain	absolutely certain

A Russian-language version of the same thirty items was prepared, with minor variations to adapt to the Soviet cultural context. Each response was scored on a scale from -2.5 to $+2.5$, a negative value being assigned to the behavior urged by age mates. To control for a positional response set, scale direction was reversed in half of the items. The situations were divided into three alternate forms of 10 items each, with a different form being used for each experimental condition. Thus under any one condition a child could obtain a score ranging from -25 to $+25$ with zero representing equal division between behavior urged by peers and adults.

Results

Mean values obtained by boys and girls in each culture under the three experimental conditions are shown in Table 1, relevant mean differences and corresponding significance levels in Table 2. Several findings emerge from this analysis. First of all, there is clear evidence that Soviet children are far less willing than their American age mates to say that they will engage in socially disapproved behavior. The mean scores for Russian boys and girls (Table 1, Col. IV) average about 13 and 16 respectively, values that are clearly on the adult side of the continuum. The corresponding American averages of approximately 1 and 3.5 are barely over the dividing line, indicating that the children are almost as ready to follow the prompting of peers to deviant behavior as to adhere to adult approved standards of conduct. The above cultural difference is highly significant across both sexes (Table 2, Line 1).

Second, the data indicate that both in the USSR and in the United States, boys are more inclined to engage in socially undesirable activity than girls. The absence of a reliable sex by culture interaction (Column IV) indicates that the sex difference was no larger in one country than in the other. It is noteworthy that despite the differing conceptions of the role of women in the two societies, females in the Soviet Union as in the United States lay greater claim to virtuous behavior, at least up to the age of twelve!

Third, turning to the experimental effects, we learn (Line 3) that in both countries children gave more socially approved responses when told that their answers would be seen by adults than when faced with the prospect of having their statements shown to classmates. Although American youngsters exhibited a greater shift than their Soviet counterparts, a fact which suggests stronger conflict between peer and adult influences in the United States, this cultural difference is

TABLE 1. Mean scores obtained by boys and girls in the U.S. and the USSR under three experimental conditions.

Subjects	I Base	II Adult	III Peer	IV Average across conditions
Boys				
Soviet	12.54	14.21	13.18	13.30
American	1.02	1.57	.16	.92
Difference	11.52	12.64	13.02	12.38
Girls				
Soviet	15.13	17.02	16.90	16.33
American	3.83	4.35	2.38	3.52
Difference	11.30	12.67	14.52	12.82
Both sexes				
Soviet	13.84	15.62	15.04	14.82
American	2.43	2.96	1.27	2.22

TABLE 2. Differences in total score and experimental effects by culture and sex. (Single and double asterisks indicate differences significant at the .05 and .01 level respectively.)

	Soviet	American	Effect across both cultures (Soviet plus American)	Cultural difference (Soviet minus American)
	I	II	III	IV
Total scores				
1. Both sexes (Girls + Boys)	14.82	2.22	---	12.60**
2. Sex differences (Girls - Boys)	3.03	2.60	5.63**	.43 n.s.
Shift scores				
Both sexes (Girls + Boys)				
3. Adult-peer conflict (Adult - Peer)	.58	1.69	2.27*	-1.11 n.s.
4. Adult shift (Adult - Base)	1.78	.53	2.31	1.25
5. Peer shift (Base - Peer)	-1.20	1.16	-.04	-2.36
6. Adult shift - peer shift	2.98	-.63	2.35 n.s.	3.61*

Sex differences (Girls - Boys)

None of the shift effects showed a significant interaction by sex.

TABLE 3. Variances among classroom means under three experimental conditions.

	American	Soviet
Base	36.01**	43.40**
Adult	13.43	9.25
Peer	45.77**	17.01*

not statistically significant (Line 3, Col. IV). A reliable difference does appear, however, for the remaining independent degree of freedom measuring which shift was greater, that from base to the adult condition or from base to peer condition. As indicated in Table 2, Line 6, Soviet children shifted more when subjected to pressure from grown-ups, whereas Americans were slightly more responsive to pressure from peers. The components entering into this difference are shown in Lines 4 and 5 of the same table. Although the cultural differences cannot be subjected to an independent statistical test, since they are incorporated in the single degree of freedom tested in Line 6, they do provide a more detailed picture of the different reactions of children in the two countries to pressure from grown-

ups *vs.* age mates. Thus we see from Line 4 that although both Russian and American youngsters gave more socially acceptable responses in moving from the neutral to the adult condition, this shift was more pronounced for the Soviet children. Moreover, under pressure from peers (Line 5), there was a difference in direction as well as degree. When told that classmates would see their answers, American pupils indicated greater readiness to engage in socially-disapproved behavior, whereas Soviet children exhibited increased adherence to adult standards. In other words, in the USSR, as against the United States, the influence of peers operated in the same direction as that of adults.

In summary, our original hypothesis has been sustained in a number of respects. First, in contrast both to American and English children, Russian youngsters showed less inclination to engage in anti-social activity. Second, although pressure from adults induced greater commitment to socially approved behavior in both cultures, Soviet children were more responsive to the influence of grown-ups than of peers, whereas their American age mates showed a trend in the opposite direction. Putting it in another way, pressure from peers operated differently in the two countries. In the USSR it strengthened commitment to adult-approved behavior; in the United States it increased deviance from adult standards of conduct.

If, as our data strongly suggest, the social context is a powerful determinant of behavior, then we should expect differences in responses to be associated not only with molar social structures like cultures but also smaller units such as classroom groups. This expectation can be tested from our data by determining whether, in each culture, there are significant classroom effects (the error term for this comparison is the mean square for individual differences within classrooms). Table 3 shows the variance of classroom means in each country under each of the three experimental conditions. The accompanying significance levels reveal that there are reliable classroom differences in both countries, but only under base and peer conditions. It would appear that pressure from adults has the effect of dissolving the tendency to conform to peer group norms which operates in the absence of monitoring by parents and teachers. Although the pattern of classroom variances under the three experimental conditions differs in the two countries—the highest mean square occurs under peer condition in the United States and base condition in the USSR—this cultural variation is not significant. Nor were there any reliable classroom differences associated with the sex of the child.

The finding that in both societies adult pressure dissolves group solidarity suggests some opposition between adult values and peer interests in the Soviet Union as well as in the United States. The fact remains, however, that at least in our data, readiness to resist promptings to anti-social behavior and responsiveness to adult influence were greater among Russian than among American children. In addition, the results showed that in the USSR peer groups exerted some influence in support of adult standards, whereas in America they encouraged deviance from adult norms.

Although these results are in accord with our original hypothesis—indeed perhaps for this very reason—it is important to stress the limitations of the study. To begin with, our samples were rather small, only six classrooms—comprising less than 200 cases—in each culture. Second, both samples were essentially

accidental, the American classrooms being drawn from two schools in a small city in upstate New York, the Russian from three *internats*—or boarding schools—in Moscow. The latter fact is especially important since one of the reasons for the widespread introduction of boarding schools in connection with the educational reform carried out in the Soviet Union during the past nine years was to make possible more effective character education in the school environment. It is therefore possible that pupils in the internats are more strongly identified with adult values than those attending day schools. For this reason, the experiment here described is currently being carried out—through the collaboration of the Institute of Psychology—in six other Moscow classrooms in schools of the more conventional type where the students live at home. At the same time, the experiment is also being repeated in a series of classrooms in a large American city more comparable to Moscow.

Even if these further and more relevant replications confirm the trends revealed by the present data, two additional questions remain. First there is the matter of the generalizability of the results outside the experimental setting. Although carried out in school classrooms, the research remains in effect a laboratory study dealing with hypothetical situations rather than behavior in “real life.” What evidence is there that in fact American children are more likely than their Soviet age mates to engage in anti-social behavior? None in the present study. The present investigator has reported elsewhere, however, some field observations of Soviet children which described a pattern quite in accord with the findings of the present research. For example,

In their external actions they are well-mannered, attentive, and industrious. In informal conversations, they reveal strong motivation to learn, a readiness to serve their society. . . . Instances of aggressiveness, violation of rules, or other anti-social behavior appear to be genuinely rare (Bronfenbrenner, 1963).

Finally, we must bear in mind that both the earlier observations and present experimental study were carried out with children at a particular age level—namely late childhood and early adolescence. We are therefore left with the all-important question—left unanswered by our data—as to how these same youngsters will behave as adults. Do children who at the age of 12 or 13 yield to peer pressures toward anti-social behavior continue to show such reactions in later years? Does early commitment to the values of the adult society endure? Does the presence of such a commitment in adulthood require that the norms of behavior among children be fully compatible with those of grown-ups, or does some conflict of interest further the development of capacities for independent thought and responsible social action? Our results shed little light on these important questions.

Despite the acknowledged limitations of the study, it has several important implications, both theoretical and practical. With respect to the former, it demonstrates that social pressure can have substantial effects even in such differing social systems as those of the Soviet Union and the United States. At the same time, the research indicates that these effects can vary appreciably as a function

of the larger social context. Where the peer group is to a large extent autonomous—as it often is in the United States—it can exert influence in opposition to values held by the adult society. In other types of social systems, such as the USSR, the peer group—and its power to affect the attitudes and actions of its members—can be harnessed by the adult society for the furtherance of its own values and objectives. This fact carries with it important educational and social implications. Thus it is clear that in the Soviet Union the role of the peer group is in large part the result of explicit policy and practice. This is hardly the case in the United States. In the light of the increasing evidence for the influence of the peer group on the behavior and psychological development of children and adolescents, it is questionable whether any society, whatever its social system, can afford to leave largely to chance the direction of this influence—and realization of its high potential for fostering constructive achievement both for the child and his society.

Part **4**

FACTORS AFFECTING LEARNING

*What Pupils Bring to Learning
Discipline: The Learning of Self-Management
Social and Emotional Problems in the Classroom*



FACTORS AFFECTING LEARNING

THE EFFECT OF
TEACHING METHODS
ON THE LEARNING OF
THE HISTORY OF THE
UNITED STATES



WHAT PUPILS BRING TO LEARNING

Were it not for the twin hazards of motivating learners and managing their behavior, the teacher could devote all of his efforts to specific learning processes. But all too often so much energy must be given to encouraging interest and shepherding distracted or recalcitrant learners that little is left for the curriculum. However, since self-control and self-motivation are essential attributes of the mature individual, they are in themselves major concerns of the school.

Time was when motivation for many pupils was "legislated" by the teacher. Pupils were expected to do tasks simply because the teacher had assigned them. Some teachers still follow this pattern, but compulsory education does not necessarily make a ready mind. Actually, formal education has been invested with greater social importance today than ever before: at every turn the youngster is told that without an education he has no future. It might seem that this would play right into the teacher's hands—ready-made, socially reinforced involvement. But often it does not work that way. For one thing, the result is often instrumental achievement, working for grades with no interest in the knowledge or skill and no personal gratification in what is learned. For such children, in particular, anxiety may go up as pressure increases.¹ Since educational accomplishment is now seen as vital for all members of our society, parents and pupils become immersed in the almighty grade-point average from the first grade on. Evaluation is for almost all schools a competitive matter (who has heard of a school which gives all A's or E's?), so some pupils are doomed to receive mediocre or failing feedback even if they do their best. "Why try?" soon becomes a code. And if you are not succeeding, it is natural to reject the whole school experience as "unimportant"—"Who cares about succeeding in such a stupid rat race?" Then too, some children find

¹For a discussion of the way such pressures can affect youngsters, see *Children under Pressure*, edited by R. C. Doll (Columbus, O.: Merrill, 1966).

that school failure is one of the best ways to contest with their parents; thus many achievement problems have their roots outside the school.

Another condition which seems to be on the increase in our society is the tendency to do only that for which an immediate reason—one which fits into the value system of the individual—is apparent. There is less willingness to do a thing just because the school requires it. This has been brought out sharply in the studies of deprived children and youth who are reluctant to take on faith that which seems—and in fact often is—useless to them. The same demand that an enterprise justify itself before being undertaken can be seen in all phases of our society; it is reflected in educational institutions from the kindergarten through the graduate school. In fact, some of our most serious students are most disaffected with uninspiring and mechanical education. The teacher cannot settle for “How can I get them to do it?” Rather he must ask, “How can I provide a meritorious educational experience which will really involve them?”

But before we can talk about motivation we have other critical questions to ask. Is the pupil capable of doing what the teacher expects? Does he have what it takes to be successful at what we intend him to do? And “he” means the individual pupil rather than a hypothetical average fifth- or ninth-grader. Planning learning activities to challenge the divergent capabilities without frustrating the high or the low is a most difficult task. The second question is: “Is he prepared by previous educational experience for the task at hand—is he ready?” A person can be willing—even highly motivated—without being able. One way to sensitize yourself to this issue is to think of the required or assumed prerequisites for some specific course you have taken. What abilities and past experiences are needed the first day of class in educational psychology? calculus? German? meteorology? harmony?

Both native capacities and prior experiences will limit what is learned. A tone-deaf pupil would have difficulty in the music class. A person with limited intellectual ability will never be ready for calculus. Any learning experience has readiness requirements in ability level and past learning. Simply enrolling in a class does not make one a learner.

MEASURING INTELLECTUAL CAPACITY

In the one-room school of little-red-schoolhouse days the teacher was well aware of wide differences in developmental level and made provision for them. Often instruction was highly individualized. Today, with pupils enrolled by chronological age, all the children in a class are close to the same age, especially in the lower grades, and it is easy to assume that they should be able to learn about the same things. Accordingly, it is common practice to insist that they all reach a certain standard before proceeding to the next grade. But chronological age may be a poor indicator of developmental age. As we saw in Chapter 3, children pass through the same general growth stages but each in his own way and at his own rate. Starting with unequal potentials at birth, the range of differences keeps widening as children grow older. Thus a child whose mental development is two years ahead of the average in first grade is likely to be four years ahead by sixth grade.

With enrollment now strictly according to birth dates in most school systems, a first-grade class usually has a spread of only twelve to fourteen months in age. But in developmental level, the range may be three or four times as great. By the eighth grade, the range in social and emotional development, though harder to test precisely, is equally apparent. By the eighth grade, too, differences in physical developmental level have become striking.

It is evident that our grade-a-year organization, with textbooks at the prescribed levels, creates some serious problems in the organization of learning experiences. For the slow-developing youngster, it may mean constantly meeting hurdles that are too high, opportunities for which he is not ready, and tasks beyond his ability or interest. Whether he is passed along without meeting the norm for the grade or held back with younger children until he can meet it, he is likely to suffer frustration and a sense of failure. For the fast developers, it may mean unneeded repetition, "baby stuff," and waste of potential—open doors that they no longer care to go through, padlocks on the gates they would like to open.

For the teacher, the grade-a-year organization means that there will inevitably be wide differences in readiness for learning among the members of a class. Not all children will be ready for the same concepts and understandings or the same group activities or the same social relationships or the same degree of personal responsibility and independent study. Heterogeneity in physical, intellectual, social, and emotional development is a fact to be faced for the one-grade teacher as surely as it used to be for the teacher of the one-room school.

Scholastic aptitude (intelligence) tests

The first attempt at systematic measurement of children's potentialities for schooling was made in France by Alfred Binet around the turn of the century. What he did, in effect, was to gauge children's ability to learn on the basis of what they had already learned, as compared with others of their own age. That is, he devised several tasks of graded difficulty and found out the age at which most children could perform each task; thus it was possible to determine a given child's "mental age" from his performance on these tasks.

From this beginning came the first *Binet-Simon* intelligence scale, revised several times in this country as the *Stanford-Binet* scale—most recently in 1960. It was originally and still is a practical instrument for making objective, measurable, and verifiable judgments about an individual's capacity for learning—especially his capacity for academic learning. We infer potential for learning from behavior partly dependent on a child's past learning. Every effort is made, of course, to reduce this element of past learning to a minimum and to choose tasks dependent only on learning that practically all children would have a chance to acquire. In this way it is hoped that scores will show how well or how poorly children have been able to use their common opportunities (a matter of learning *capacity*), rather than what opportunities they have had. How successful such efforts have been will be discussed later in this chapter.

The 1960 *Stanford-Binet* is an individual test with items starting at the two-year level and going up to superior adult levels, but it usually is not given to adults. At each level there are six items calling for several different kinds of

abilities such as memory, visual imagery, reasoning, definition of words, motor skill, interpretation, and even esthetic judgments. The tests for Year II, for example, call for:

- Putting blocks into a three-hole form board
- Remembering after ten seconds which of three boxes holds a toy
- Identifying four parts of the body
- Building a block tower of four or more blocks
- Identifying three common objects
- Using two or more words together

The tests for Year XI call for:

- Looking at two designs for ten seconds, waiting four seconds, and then reproducing them
- Telling what is foolish about two statements
- Defining abstract words
- Repeating a fifteen-word sentence after hearing it once
- Telling why a child's clothes would be burned after he had tried unsuccessfully to bring a "pretty little animal" home from the woods
- Telling how certain objects are alike

The examiner tests a child between the levels where he passes all the items and fails all the items, then adds together all his credits for a composite score—an overall mental age (MA).

But the mental age figure, by itself, gives no clue as to a child's *rate* of mental growth and hence no basis for prediction. To get such a figure, we take the ratio of mental age to chronological age. Then, to avoid decimals, the ratio is multiplied by 100 to give us an intelligence quotient, or IQ.

$$\frac{MA}{CA} \times 100 = IQ$$

With an *average* rate of mental growth, the mental age and the chronological age are about the same, $\frac{5}{5}$ or $\frac{10}{10}$ for example, which results in an IQ of 100. With faster *mental* growth, the top of the fraction is larger; with *slower* mental growth the bottom of the fraction is larger. Thus for a bright child with a higher mental than chronological age, the fraction is greater than 1—perhaps $\frac{7}{5}$ or $\frac{14}{10}$. The resulting IQ is above 100, and the higher the MA in relation to the CA the farther above 100 will be the obtained IQ. Slower children will have IQ's under 100.²

Intelligence test scores are distributed among the population according to a "normal" curve (page 593). Most of the scores cluster around the middle with fewer and fewer toward the extremes above and below. About two thirds of the population would obtain IQ's between 84 and 116, leaving about a sixth with scores above this range and another sixth with scores below.

²In the 1960 edition, a table of IQ's is provided which incorporates the necessary corrections for differing variability in test performance at different age levels.

INTELLIGENCE CLASSIFICATIONS

classification	I.Q.
mentally defective	69 and below
borderline defective	70-79
low average	80-89
average	90-110
high average	111-120
superior	121-130
very superior	131 and over

The *Stanford-Binet* is a predominantly verbal test of intelligence in that most of the items deal with vocabulary, general information, comprehension, and similar material requiring verbal responses to verbally presented questions. Such a test does not adequately measure the intelligence of an illiterate or verbally handicapped child. To fill this need, there are several *performance scales* which require a minimum of verbal responses by either the testee or tester. Widely employed performance tests of intelligence include the *Merrill-Palmer Pre-School Performance Tests* for children approaching school age and the *Arthur Point Scale of Performance Tests* for children from five to fifteen. These performance tests require such activities as copying a design by using colored blocks, completing a picture, copying a block structure made by the tester, and arranging a series of pictures into a meaningful sequence.

Individual tests that have both verbal and performance items and give separate scores for the two include the *Wechsler Adult Intelligence Scale* (WAIS) for adults down through adolescents, the *Wechsler Intelligence Scale for Children* (WISC), and the *Wechsler Preschool and Primary Scale of Intelligence* (WPPSI). With these tests, a person is given a verbal IQ, a performance IQ, and a total IQ. Actually these are batteries of individual tests which are scored separately, and then combined to yield a general measure of the person's ability to deal effectively with his environment—to think and act "intelligently."³

These individual intelligence tests take over an hour to give and must be administered, analyzed, and scored by a trained psychologist. Thus they are obviously too expensive for use in all situations where the school needs evaluation of pupil potential. In most cases group tests are given to a class as a whole by the teacher; then, where facilities are available, children with special problems are tested individually.

Group testing was originally developed in the First World War to screen out the deficient and make better use of the able. Today schools are the major user of group intelligence tests. Commonly used group tests are the *California Test of*

³One of the best books on the subject of testing, kept up to date, is *Psychological Testing* by Anne Anastasi (New York: Macmillan, 1968).

Mental Maturity (kindergarten through adult), the *Otis-Lennon Mental Ability Test*, the *Kuhlmann-Anderson Intelligence Tests*, the *SRA Short Tests of Educational Ability* (all three for grades K through twelve), and the *Cooperative School and College Ability Tests* (SCAT), for grades four through sixteen. There are many others. These group tests are much less valid than individual tests because their sampling of abilities is restricted by time, because they depend more on reading ability, and because the tester cannot judge whether all of those being tested are paying attention, trying their hardest, or even understanding what they are to do.

Binet's original tests were for educational purposes—to devise a way of determining children's potential for education. It is perhaps natural that most intelligence tests should have been concerned chiefly with scholastic aptitude—the intelligence needed for academic work. Social intelligence, practical intelligence, and other nonacademic types of flexibility in solving problems have intrigued people as undoubted components of the broad intelligence we all need to solve adult life problems, but they have not found their way into many of the intelligence tests. The intelligence rating we get for anyone on the present tests remains largely a rating of his academic intelligence; it is not a statement of his full potential for solving life's problems.

The meaning of the IQ

The IQ concept was originally developed in connection with the *Stanford-Binet* scale and has become such a standard measure that many other tests now give scores in terms of IQ or supply directions for computing an "IQ equivalent." But in many cases the "IQ's" derived in these various ways and from the different kinds of tests are not equivalent at all. For example, the IQ equivalent obtained on the *SRA Primary Mental Abilities* test is specifically a measure of five factors—verbal meaning, space, reasoning, number, and word fluency—whereas the *Stanford-Binet* scale samples many more abilities and weights the verbal factors much more heavily.

It is important to remember that no test tells *how much* ability or aptitude an individual has. We never can say that someone has so many cups or cubits or other units of ability but only how his ability compares with that of others who have taken the same test. If we find that Susie has a mental age of ten and Joey a mental age of five, we cannot say that Susie has twice as much intelligence as Joey but only that she shows a level of ability similar to that of most ten-year-olds and he a level similar to the average five-year-old. Nor does an IQ of 100 indicate twice as much intelligence as an IQ of 50. An IQ of 100 means only that one's mental age and chronological age are the same—that at the age of ten one is performing at the level that most ten-year-olds perform. An IQ of 50 indicates that a child is growing only half as fast intellectually as he is chronologically. Absolute amounts of ability we never know.

Because of the common tendency to assume that an IQ means the same thing however it is derived, some people prefer to use *percentile scores*.⁴ If a child is at

⁴An explanation of these and other basic statistical concepts is given in Section 9 of the Reference Manual.

the 90th percentile, he has scored equal to or better than 90 per cent of those who took the test. We are not so likely to assume that the 90th percentile on one test means the same thing as a 90th percentile ranking on another test as we are to assume that two IQ ratings of 130 mean the same thing. Also, whereas there is a tendency to think of a child as "having" a certain IQ there is no comparable danger of thinking he "has" a 90th percentile. In the latter case, it remains obvious that the figure reflects his placement on this particular test relative to others who took it, while the IQ is often thought of as an absolute quantity existing in the child, apart from a particular test and without reference to other people.

What do intelligence tests really measure?

As we have seen, scholastic aptitude tests are always partly measures of what an individual has learned. Unfortunately, opportunities for even the most basic learning are by no means universal. Children of different racial, geographic, and economic groups often have quite different opportunities for learning. A rural child may be penalized on some items because he has not had certain experiences common to most city children. A child who is hard of hearing or a child whose parents speak little or no English has somewhat different experiences and limited chances for certain kinds of learning. Whole groups of children in urban and southern slums test low and perform low in the early grades, and the longer they are in the typical school, the further behind they drop in ability and performance. Criticism has been so severe that some schools have ceased to use IQ tests. Their argument is that, as we saw in the first chapter, teachers may expect less and doom the child to failure if he tests low. The lower functioning of these children at the start, coupled with the low expectations of their teachers, creates a circular deterioration.

Studies of early perceptual and cognitive deprivation in infancy and early development suggest that a certain degree of heterogeneity of sensory stimulation is essential if an individual is to develop an accurate "cognitive map" of his world, discover the meaning and value of different parts of it, be able to predict regularities and probabilities, and develop strategies for coping with new situations (Bruner, 1959). J. McV. Hunt has pointed out that these perceptual needs shift as the child grows:

At earlier phases of development, the variety of circumstances encountered appears to be most important; somewhat later, the responsiveness of the environment to the infant's activities appears to be central; and at a still later phase, the opportunity to understand the causation of mechanical and social relationships seems most significant.
(1964, p. 87)

A child's performance on a test cannot help but reflect his opportunity or lack of opportunity for such experience as well as his original potential.

Yet before we criticize attempts to assess capacity by using tests that depend on opportunity for learning too, it should be pointed out that we can never hope to test potential alone. We can assess potential only through behavior of some sort, and there is nothing a child can do that does not incorporate *some* past learning.

Both the understanding of the directions and the carrying out of the necessary motions inevitably rest on some learning as well as on potential.

The problem of devising items equally fair for children of different socioeconomic backgrounds is a very real one. A child from a home in which books are valued is at an advantage in tests calling for verbal comprehension and skill; a slum child, used to a hand-to-mouth existence, is at a disadvantage in verbal reasoning but might have the advantage on items calling for sensory acuity or manipulation of concrete objects. There would probably also be considerable difference in their desire to please the tester and in their interest in doing well on academic tasks. The actual extent to which lower-class children are penalized on the current tests is still a matter of controversy, but some attempts have been made to create culture-free or at least culture-fair tests. One is the *Davis-Eells Test of General Intelligence or Problem-Solving Ability*, which contains items based on life situations that would be familiar to any urban or small-town child. Directions for the elementary-age form are oral, and no reading is required. Time is not limited, making it a test of power rather than speed. Another is Cattell's *Culture-Free Test of Intelligence*, which has forms for both children and adults. Certainly in cases where cultural limitations are believed to be a factor, tests like these would be helpful tools.

No one has ever defined all the capacities and abilities needed for school learning, and perhaps such a formulation can never be made. Some of the prerequisites, such as those regularly tested for in the scholastic aptitude tests, are fairly obvious; others are less so. For example, gross motor control, with such subfactors as dexterity, balance, and fatigue level, is undoubtedly an important element in a child's potential for schoolwork. To some degree, his handwriting, artistic creations, skills in sports, and proficiency in manual arts depend on his precision of muscular control. Basic differences in sensory thresholds and in potentials for making fine discriminations would affect many kinds of performance. We know that visual responses to form and color vary, and that children differ greatly in auditory sensitivity. Many speech problems in young children, for example, evidently develop because the children do not *hear* the fine differences between certain sounds. Any consistent differences in sensitivity or ability for control could be expected to produce different potentialities for school learning.

Another problem in testing abilities grows out of the difficulty in defining abilities and in getting measures of only one ability and not others. Establishing the boundary lines of one ability is extremely difficult. The whole problem is further complicated by the fact that an ability often turns out to have a number of component parts or subfactors (which turn up in other clusters, too) and itself tends to be a component part of still broader abilities. One test of musical aptitude, for example, contains subtests for ability to discriminate pitch differences, intensity differences, and rhythm differences as well as subtests for consonance and tonal memory. To be a good violinist, one would probably need all these abilities and many others, including fine motor coordination and considerable esthetic and emotional sensitivity.

⁵To be more precise, it is well to note that psychologists distinguish between *capacities* or *aptitudes*—potentials for developing a concept or skill—and *abilities*—actual present potentials for performance. For example, a child may have the capacity to learn to read but for one reason or another may not have the ability to read today. Capacity is trainability; ability is present level of skill.

Any test of capacity or ability⁵ also measures to some extent the subject's motivation and work habits. Attitudes toward authority, interest (or lack of it) in doing well, persistence, willingness to put forth effort, a habit of speed or deliberateness, meticulous care or carelessness—all these personal characteristics may affect one's score on a so-called intelligence test.

If a child misses three words on a spelling test, maybe it was because he did not know them, or maybe it was because he was thinking about the big game after school, or because he was too tired or hungry to make any effort to remember, or because he did not care whether he did well or not. If, on an intelligence test, a child fails to repeat three digits backwards on request or does not solve a maze problem in the allotted time, how can you be sure you are justified in ascribing his failure to lack of ability? How can you be sure that strangeness, tenseness, lack of interest in such tasks, or preoccupation with other matters may not be playing as important a role as ability in his performance? Years ago, Rust (1931) found that intelligence test scores of one group of very young children went up as much as 35 points in four days as the children came to feel more relaxed and comfortable with the examiner.

Since performance in school is always compounded of aptitude, interest, general ability, previous experience, study habits, emotional adjustment, and many other factors, aptitude test scores are never a guarantee of either success or failure in a given field. For prediction and planning for a given student, they should be used only in conjunction with other information about the individual.

Despite all these difficulties, great progress has been made in devising tests that indicate children's probable potential for learning. We now have tests of general scholastic aptitude, tests of specific aptitudes for different curriculum areas, and tests that indicate musical ability, artistic ability, clerical ability, ability to perceive and manipulate spatial relationships, and even abilities for completing academic programs in law, medicine, architecture, nursing, dentistry, or sales. Such specialized tests as these last, however, are usually not given by teachers but by psychologists trained in testing procedure and interpretation. Beyond knowing that such tests exist as possible resources, a teacher need not be concerned with them.

The three types of tests that teachers should understand and may be called upon to administer are scholastic aptitude tests (often called intelligence tests), interest or personality self-inventories, and achievement tests. As already indicated, teachers give only group tests. When an individual test seems desirable for a particular child, it should be given by a trained examiner.

Early IQ as a predictor of later ability

How much faith can a teacher put in test scores in his planning for children's learning? Is an early intelligence test score a good indication of a child's potential for learning throughout his school years? Can ability test scores be used to predict school achievement? And how can specific test scores be used to help diagnosis in special problems?

An IQ score, as you saw, indicates the ratio of mental age to chronological age. Because rates of growth are more or less steady, especially if there are no extreme

changes in the environment, the value of the fraction $\frac{MA}{CA}$ usually tends to stay more or less the same as the child grows older: $\frac{4}{3}$, $\frac{8}{6}$, $\frac{12}{9}$, for example, making the

computed IQ more or less the same too. From Olson's work (page 76), however, we can predict that slow growers will look less able than they finally turn out to be and that fast growers may look more promising at early stages than they are at maturity. We know, too, that there are irregularities in the growth process—spurts and plateaus—that may result in IQ changes of from 10 to 15 points for a child. And with major changes in the home environment, especially before school age, there may be sizable changes in IQ.

Early IQ's are especially undependable. Baker and others (1958) found that over 60 per cent of the children they studied changed more than 15 points in IQ between age 3 and age 10. Part of the problem is that the items used for testing the intelligence of preschoolers are often not comparable to those used for testing older children. For example, a child tested on the *Stanford-Binet* at 3 and again at 10 would be tested on entirely different items; those at the lower level would be largely performance items, those at the upper level mostly verbal items.

A recent study investigated the correlation between IQ scores on the Lorge-Thorndike test in the third or fourth grade and the scores made by the same boys and girls in the eighth grade (Eagle, 1966). The correlations⁶ were as follows:

	Boys	Girls
Verbal	.592	.777
Nonverbal	.494	.666

While the relationship is far above chance, the early scores of boys do not predict more than half of the variance in the second set of scores. Girls are more stable in their IQ's than boys, and the verbal is more stable than the nonverbal for both groups. Both boys and girls also gained significantly over the period (an average of about 3 IQ points), with three times as much gain for nonverbal as for verbal scores.

It is hard to assess the meaning of changes in obtained IQ's where they do occur. They may indicate changes in ability or in rate of growth from one test to the next, but they may also reflect (1) above-average or below-average opportunities for learning in the interim, (2) changes in motivation or effort on the part of the subject being tested, (3) error in measurement at one time or the other or both, or (4) test items at the two levels that are not comparable.

The use of intelligence tests in the classroom

A general group intelligence test given perhaps every two years can be a very useful screening device. Sometimes it is up to the teacher to select and administer such a test; sometimes the teacher is given only the final scores. It is very helpful if there is a psychologist available to break down the total IQ score into part scores

⁶The concept of correlation is explained in Section 9 of the Reference Manual.

and analyze these for cues to a child's strengths and weaknesses in potential. If the test is one that relies heavily on verbal skills, children understimulated at home in this area may be penalized and the teacher may want to get an additional measure for them on a test that gives a performance score. But even where such a background is not a factor, an examination of the part scores may be revealing. Two children who come out with the same final score may actually have succeeded at quite different items. One may have done well on items calling for memory, the other on items calling for reasoning and verbal comprehension.

It will be readily apparent that identical mental ages cannot be assumed to indicate identical potential for classroom learning. When a child is not reading as well as his mental age would seem to make possible, an examination of his performance on individual test items may reveal low auditory recall, poor visual discrimination, and poor memory. Instruction and expectation of progress will be more realistic if geared to these individual item scores rather than to the overall mental age figure.

When a child is having trouble with his learning or is being considered for acceleration or other special treatment, an individual test may be extremely helpful. The particular value of such testing in the case of learning disorders will be discussed subsequently. An individual intelligence test, given and interpreted by a competent psychologist, gives the teacher the equivalent of a diagnostic interview—in which an assessment of the child's relationship to authority, anxiety, persistence, reactions to frustration, and strategies for attacking new problems can all be added to the analysis of his abilities.

THE RELATIONSHIP BETWEEN INTELLIGENCE AND ACHIEVEMENT

A number of studies of the relationship between tested intelligence and school achievement have been carried out. At the elementary level, the correlations between intelligence and achievement in reading tend to be about $+ .50$, between intelligence and achievement in arithmetic about the same, between intelligence and achievement in spelling in the $+ .30$'s, and between intelligence and writing or drawing skills in the $+ .15$ to $+ .20$ area. In high school, the correlation between intelligence and reading may be as high as the $+ .80$'s, while correlations between intelligence and achievement in English, social studies, and the sciences range in the $+ .50$'s and $+ .60$'s, and between intelligence and spelling in the $+ .40$'s. In one study of high-school seniors, the correlation between overall achievement and intelligence was found to be $+ .85$ (Ketcham, 1956).

Three conclusions can be drawn from these figures: First, there is a positive relationship in every case—there are no negative correlations. Thus there is real value to the teacher in having knowledge about the child's learning ability as represented by intelligence test scores. Second, the relationship is much higher for some school subjects than for others. It is highest for the subjects heavily dependent on verbal and reasoning ability, perhaps reflecting the fact that the tests used often sample these abilities more than others. Third, the relationship is higher at the high-school level than earlier. Evidently, the higher one goes on the educational ladder, the more important intellectual ability becomes relative to other factors as a predictor of success.

But another conclusion is equally important. In no case is there a perfect

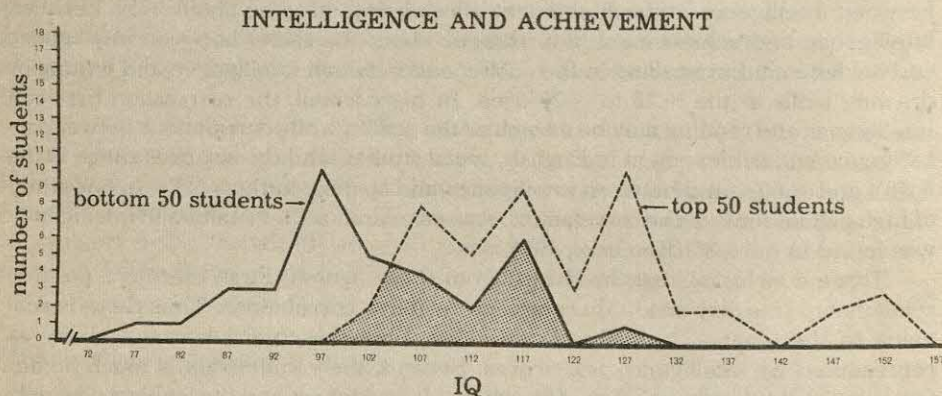
correlation between ability and achievement. Too many factors other than ability enter into what a child actually does. Intellectual ability is a sorting-out factor, but many factors, such as drive, interest, opportunity, other personal assets and weaknesses, and one's self-concept, influence whether and how intellectual ability is developed and used. Results of intelligence tests should be viewed as only one useful clue to be studied and analyzed. They are the best single index, but prediction can never be based on tests alone and they should not be used for making demands on a youngster which might not be appropriate in the broader picture.⁷

The danger of limiting students' opportunities on the basis of low test scores is brought out in a study by Strauss (1960). He found that of 500 successful scientists with Ph.D. degrees 7 per cent had been in the lowest quarter of their high-school graduating classes. On elementary- or high-school tests many had obtained an IQ assumed to be too low for college graduation.

There is abundant evidence that measures of mental ability do have something to do with one's destiny. Both income and sociocultural level tend to be correlated with intelligence. The chart opposite shows the ranges of scores on the *Army General Classification Test* for several occupations. Although the average IQ increases step by step from teamsters to accountants, perhaps the most striking thing is the wide overlapping. Some of the teamsters—and some of every other group—are higher than the mean for the accountants. Evidently in life tasks as in school learning, factors other than pure intellectual ability help to determine how far one goes.

Special educational problems of the mentally deficient

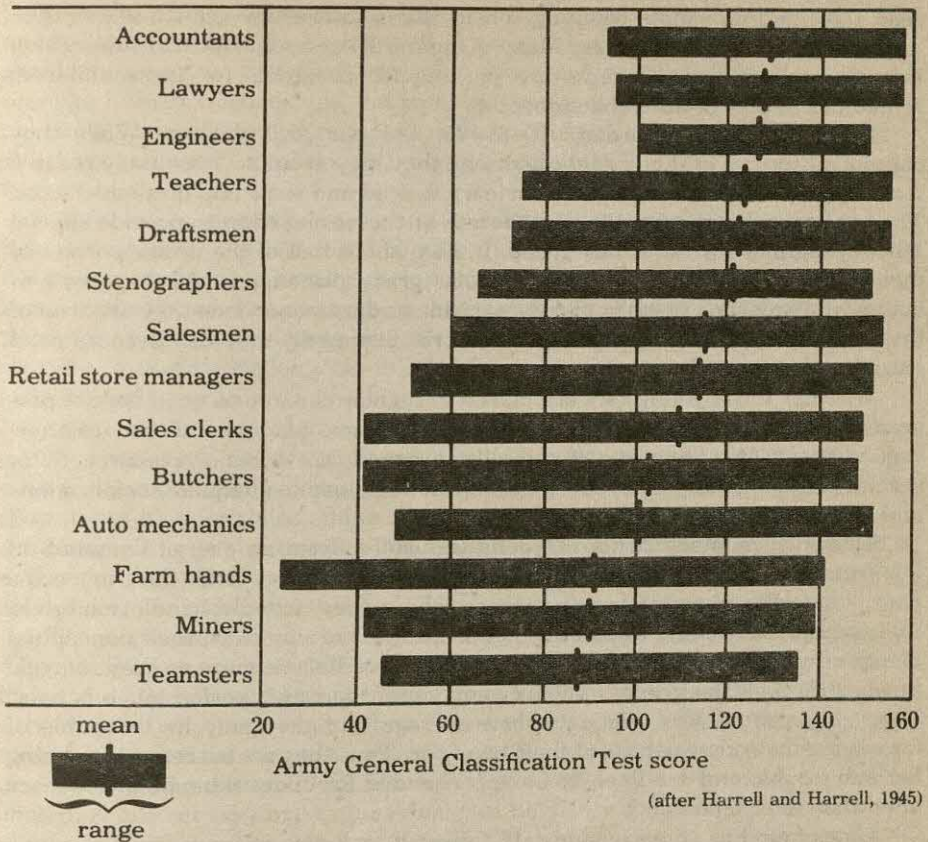
With the recent explosion of concern about the intellectually limited, there is less and less certainty regarding what they can and cannot be taught to do, given



The curves above show the IQ's of the top fifty students and the bottom fifty (on the basis of grade-point average) in a high-school graduating class of 400. Half of those in the bottom group in achievement had intellectual potential above that of the lowest member of the top group. Obviously factors other than intelligence are reflected in the achievement of these two groups of students.

⁷Factors influencing achievement are discussed by R. L. Thorndike in *The Concepts of Over- and Underachievement* (New York: Teachers College, 1963). Thorndike's careful analysis includes the implications of making predictions on the basis of a few tests whose reliability is questionable. It is a powerful corrective influence to overdependency on test results.

INTELLIGENCE AND OCCUPATION



proper techniques and sufficient time. Even the generally accepted device of special classes has been questioned, for special classes in themselves do not necessarily enhance performance. It seems that what such children need is appropriate educational opportunity—whether it be in a regular class or in a special class. The emotional acceptance these pupils receive is also critical to their well-being and self-esteem and hence to what they learn. Teaching them is anything but a mechanical process.

The mentally retarded comprise between 3 and 4 per cent of the child population. Classification systems differ, but the general pattern follows. It must be remembered, however, that many of these children present multiple handicaps, having difficulties in personal adjustment and socialization as well as in intellectual competency.

Custodial (Profoundly retarded): IQ 0–25, less than 1 per 1000 children. Even as adults these individuals behave like two-year-olds and must be institutionalized. They are considered untrainable.

Trainable (Severely retarded): IQ 26–50; approximately 3 per 1000 children. As adults these individuals will perform work at about the first-grade level, and

can be trained to take care of their personal needs. Most can eventually learn to read signs and do simple counting. Their rate of intellectual growth is less than half the rate of normal children. Many of them will need some form of supervision throughout their lives. Parents are pushing for programs for these children, sometimes as part of the public school.

Educable (Mildly retarded): IQ 51-75; 4-5 per 1000 children. While they can not all survive in the typical classroom, they may as adults eventually reach a mental age of eight to eleven, and can learn to read and write and do simple tasks. They are considered educable, and there is an increasing effort to provide special school programs for all of this group. In fact, about half of the upper portion of them make reasonable progress in regular grade placements. As they grow to maturity, many such persons make astonishing adjustments once they are free of the pressure of schooling they cannot absorb. Eventually they can become good citizens, parents, and workers.

Whether these youngsters are placed in regular classrooms or in special programs they need, not a watered-down curriculum, but one tailored to their capabilities. Work programs, if specially designed, are a major resource. With careful planning, many retarded children can be helped to adequate socializations and a functioning place in society.

Typically, mentally deficient youngsters suffer from an overall limitation in intellectual capacity. They usually do better in nonverbal tasks than in verbal ones, especially in concrete experiences where they actually handle materials. Their vocabularies tend to be small, their rate of learning slow, their conceptual ability very limited. They tend to get lost in the verbalistic maze as they struggle upward through the grades. Their evaluation of their own performance is poor. Their judgment is less adequate than average and they may be incapable of foreseeing the consequences of their behavior. Thus they are susceptible to being led into trouble and are likely to be apprehended for undesirable behavior more often than their fellows.

Gates found in an early study (1930) that it took almost three times as many repetitions of a new word to bring about learning in dull children as in bright ones. McGeoch and Irion (1952) found roughly the same differential ability in problem-solving types of learning as in rote learning. Actually, in many school situations the dull are simply unable to do what is assigned, even with extra time, for their ceiling of ability is below the demands made on them. Yet despite these great differences, the bright and dull sit side by side in many classrooms, all assigned the same lesson at the same time with the same time limits.

What can a teacher do to accommodate this end of the distribution in the regular classroom? First of all, remembering that it will take them longer to learn everything, he will allow much more time, go much more slowly from one step to the next, double-check to be sure it is time to move on, and not expect to cover nearly so much ground as with his average pupils. Second, he will find easier reading materials and assign simpler tasks. He will keep to the concrete, the visible and tangible, wherever possible, making ample use of models, diagrams, and demonstrations, keeping assignments on an individual basis, and encouraging pupils to ask for help when they do not understand. He will not attempt to teach the more complex concepts; the necessary simple ones he will teach through concrete objects.

Since these children are low on verbal skills, they will need to be helped with their writing—with standards cut to the cloth. They will have fewer spontaneous or original ideas and will be less deft in embellishing a theme. But from this we should not assume that they have less emotional sensitivity, for they can appreciate human relationships and can enjoy music and visual beauty. Thus they too can gain much from enriched experience. But since they lack judgment, they should not be put in a position of too much responsibility either for themselves or for others.

Often, with appropriate teaching methods, these youngsters can gain from experiences with material that might be thought to be beyond them. We should not be too confident in limiting their vistas. Shakespeare's plays were written for those in the pit as well as those in the balcony. They were intended as experiences for enjoyment and appreciation of life, not as intellectual exercises. We have no right to decide that only the bright should be exposed to worth-while ideas, insights, and pleasures.

In the many nonintellectual activities where performance is the key—such as gym or shop work—these youngsters are often better able to hold their own. But even in gym the teacher can grade on game rules read and memorized. In the shop it can be gear ratios and in music it can be recognizing the themes from a symphony. The emphasis within a subject or activity is often the critical factor in determining whether this is an arena in which the dull must fail. Words need not always reign as monarchs.

These children are as much discouraged by failure as anyone else, and if doing their best nets them only low marks and failure they will see little reason for trying to do their best. Although they cannot have the success of being first, there is no reason why they cannot have the success of achieving—of knowing they have done well what they were asked to do. Such success means planning ample time and valuing conscientious effort in the use of personal resources, however limited. A teacher who makes it evident that he values this kind of effort can help the child, too, to use this standard instead of the grade norm in evaluating himself. There is little danger—as some teachers fear—that grading him according to use of his ability will lead him to any false evaluation of his career potentials. He is usually all too aware of his shortcomings. But to use whatever ability he has, a child needs to feel he is a person of worth, capable of making some kind of contribution.

Since schools differ widely in their demands on pupils, it is difficult to say how much intellectual ability it takes to go through high school. An IQ of 80 is probably about the minimum. The borderline group (IQ of 66–79) find it increasingly hard to keep up and may, in their frustration, develop problem behavior. Many drop out of school when they reach the proper legal age. Even those in the 80 to 90 range must struggle to keep up in a good high school, where the median IQ of those who graduate may be 115.

Marginal pupils

A word must be added about an increasing problem, that of students who are near the low end of the continuum but essentially within the “normal range.”

When a school has a mean IQ of 100, these may be the 80 to 90 IQ group. When the average is 115, as it is in some areas, even an IQ of 100 may not enable a pupil to meet the performance expectations.

Classroom groups are essentially competitive. Those who are doing less well feel their failure. It has been found that even bright pupils become discouraged when they are the lowest of a very bright group. Average pupils feel it in a school where accelerated programs are the norm. But the plight of the slightly-below-average pupil is acute in some junior and senior high schools. He is too bright not to see himself as a relative failure: always placed in the slow and remedial groups, which he may take to mean that he is stupid. Almost every school has a group of these so-called "misfits"; often they are difficult to motivate and the source of chronic behavior problems. Teachers say they "can do nothing with them." It is important to remember that these youngsters are not retarded but discouraged. In low socioeconomic areas they may make up a huge block of the total school population—even setting the peer code for the school.

In some schools, there are special classes for the dull and borderline pupil from elementary through high school. In other systems, many pupils who get through elementary school only because the teacher has made special allowances for them suddenly find no such provision in junior or senior high school and are doomed to failure. There is great need for special attention to the marginal pupil throughout the period of compulsory school attendance. It is unfair as well as pointless to force attendance at school and then provide only tasks at which a youngster must fail. Furthermore, our society cannot afford to let these youngsters' talents go to waste. One way to help is by more astute individual and group counseling. Another is by giving attention to needed curriculum revisions. A third, and very important, way is by drawing parents into the counseling program to make certain that expectations are reasonable and that hope for the future is clearly seen. Marginal pupils comprise more of a motivational problem than a capability problem; we shall discuss further aspects of this later in the chapter.

Children with learning disorders

As we have seen, there are children who can be designated as "bright" or "dull" on the basis of intelligence tests. There are also children whose academic potential is not accurately reflected by such devices. Although they may have a "normal" overall IQ score, they will be found to have done very poorly on the symbolic and verbal components. Further investigation suggests that there are fairly specific areas of dysfunction and a characteristically uneven profile of potential. These are the children who are often referred to as "brain-injured," although in many instances there is no physical sign of brain injury. There are many terms for such disabilities; perhaps the most common is "learning disorders."⁸ Clearly there is no single disability condition, especially when the term is used to include motor difficulties.

⁸For an excellent review of the situation, see the chapter on "Learning Disorders" by Bateman in *Review of Educational Research: Education of Exceptional Children*, 1966, 36, No. 1. The December 1964 issue of *Exceptional Children* is devoted to papers on learning disabilities. See also the three volumes on *Learning Disorders* by Jerome Hellmuth (Seattle: Special Child Publications, 1965).

For the teacher, a special problem is presented by those in this group who cannot deal with symbols adequately, even though their life experience has included the precursors for such development. These children will have great difficulty with reading and may be equally poor at spelling, arithmetic, and writing. They tend to be low on tests involving memory, discrimination of time, space, body orientation, information, and academic skills. They are usually less able to inhibit their impulses or learn to control themselves, with the result that they frequently get into difficulty through behavior problems. These children are often at the mercy of every external stimulus, be it noise, activity in the room, or an attraction outside the window. Furthermore, some degree of emotional disturbance often develops as a consequence of failure to do what other children can do. There are days when yesterday's learning disappears entirely.

Yet often these children look "normal" and are considered by teachers as motivational problems, when actually they are not capable of meeting the demands that are being made. Teachers need to consult the experts when the presence of such conditions is suspected. A trained psychologist can use WISC patterns, the *Minnesota Percepto-Diagnostic Tests*, and the *Illinois Test of Psycholinguistic Abilities* as well as oral reading and writing samples to aid him in differential diagnosis.

The psychological basis for helping these children is threefold: (1) special "training" in areas of particular weakness revealed in the tests, such as discrimination; (2) teaching around the limitations wherever possible, using such techniques as kinesthetic word tracing when ability for visual discrimination is insufficient; (3) a more programmatic approach involving slow steps individually planned with multisensory, long-term remediation. Obviously, reading is a critical area. It is astonishing how many children are passed along even into high school without ever acquiring basic reading skills. Sometimes the symptoms of learning disorders appear to diminish at adolescence, but this is not always the case. Many of these youngsters will require special help throughout their educational careers. Adequate treatment may be impossible in the regular classroom—yet few school systems have yet made other provisions for these children.

The intellectually gifted

A great many teachers have a special fixation on the bright pupil—almost to the extent of an occupational disease. The term *genius* has been suggested for those with IQ's of 180 and above, which occur in less than one person per million. *Gifted* is usually used for those with IQ's of 140 and up. Some writers have included all those above 110 in the category of gifted, though few would go below 125.

The percentage of gifted children in the school population thus depends on what IQ level one picks as the cutoff point. About 7 per cent of the population have an IQ above 125. Less than 1.5 per cent have an IQ above 140. Some elementary and secondary schools have an unusually high proportion of able students; others very few. Unfortunately, some of the latter have enthusiastically adopted crash programs for the gifted without realizing that they had few very gifted students or none at all.

As a nation, we have become concerned about conserving and making the

best use of our human resources. The demand for technically and professionally trained personnel is outstripping the supply. You could see from the graph of occupations and intelligence levels on page 345 that many able people are engaged in tasks that demand far less than their full capabilities. Although the social and personal conditions that bring this to pass are beyond the classroom, there is much that a teacher can do to help especially able pupils achieve at a level commensurate with their ability.

Those at the genius level are precocious, usually learning to read before school and endowed with a high level of curiosity, ability to see relationships, and interest in deeper insights. Their atypicality results in some hazards for adjustment: like all children, they require careful nurture if they are to reach their potential.

The gifted, while not a large group, deserve particular attention since they are most "ready" for the experiences of the school—or one might say an advanced school. Observation shows that the gifted child, in comparison with the "child of average ability," has more spontaneous interest, thinks and perceives more deeply, and has a longer attention span. His verbal ability is greater and his use of words and ideas is more advanced. He learns faster, sees more relationships, often shows more creativity and imagination, and has a greater storehouse of information at his disposal. Contrary to folklore he is less likely to be sickly or neurotic or unattractive. Since play interests are closely related to mental age, he tends to play with children older than himself.

Gifted children often become impatient with those not as bright as they. They tend to resist repetition, to become bored with simplicity, and to devise their own methods, sometimes sloppy, to meet new situations. For example, they may develop their own phonetics to grapple with new words. Since English is only partially phonetic, this often produces poor spelling.⁹

The objective for academically talented students, as for the others, is provision for the development of each one's best potential. There is much that the regular classroom teacher can do for these children. To begin with, he can eliminate the strait-jacket curriculum where all must move in chain-gang fashion. He can cut out useless repetition and unneeded drill and let all students move ahead as fast as they can. If the teacher is willing, a pupil in the fifth-grade arithmetic class can be doing eighth-grade work. In other curriculum areas, the regular course of study can be enriched in many ways for those who are able to delve more deeply. Independent study and special projects can stimulate these able students, and their special reports can often bring insights to the rest of the class that those of less ability can grasp and appreciate but would not have been able to work out for themselves.¹⁰

These students, like the others, need to develop a pride in doing their very best. They are capable of more work and work of greater depth but they will work harder than the others and use their best ability only if they gain more

⁹Still fascinating, despite the date, are the studies of the bright child found in *Genius in the Making* by H. S. Carroll (New York: McGraw-Hill, 1946).

¹⁰For a comprehensive study of the provisions being made for gifted children, see *An Analysis of Research on the Education of Gifted Children*, by J. J. Gallagher (Office of Public Instruction, State of Illinois, 1960); also "The Function of Theory in Programs for the Gifted" by V. S. Ward (*Teachers College Record*, 1961, 62, 532-539).

satisfaction from doing so than from coasting along. And they will develop a pride in doing their best only if they gain an enhanced feeling of worth when they do so. If they put in serious, careful effort and get commendation from the teacher only to find that their classmates shun them, they may feel that they have lost more than they have gained and their feeling of achievement may be hollow—more a cause of pain than of satisfaction. Fortunately, it is largely within the teacher's power to create the climate of feeling in the classroom and to establish the values by which pupils judge each other.

To the degree that the regular classroom can manage to meet the needs of the very bright students, it is the best place for them—and in many school systems outside the urban areas the only alternative is to put a child ahead a grade. This may be a satisfactory solution for some children, but for others it may create a problem in social adjustment. In the secondary school, it is often possible to put a student in advanced classes in the courses where he has special ability. Those who can forge ahead in math or science cannot always do superior work in English composition—and vice versa.

Where numbers and resources permit, special classes for the most able pupils may be set up, although there is uncertainty about the value of this arrangement because of what it can do to the child's feeling about himself and others. Sometimes being in the "gifted" class puts youngsters under such pressure that their achievement suffers. Occasionally they become intellectual snobs. It may be as much of a problem to be "put ahead" or put in a special class as to be "left behind." But in a given situation, the possible disadvantages may be outweighed by the advantages. The attitudes of teachers and especially of parents are of tremendous importance in determining the attitude that youngsters will have toward their own special gifts.

No one plan is best for all situations. Some very able children find the climate of their particular regular classroom stifling; some do not. Some value their friendships so much that sending them to a class on the other side of town would not increase their motivation for learning. For others, spending part of their time away from their neighborhood groups can prove very stimulating.

Actually, ability grouping is more important for the dull than for the bright, for the dull are less self-sufficient and always have the low position on the totem pole. They need much attention from the teacher all along the way. But with stimulation, encouragement, and a minimum of supervision, the gifted can go far toward solving their own problems.

With both the dull and the very bright, parents must be brought into the picture to assure an understanding at home of what the school is trying to do and a continuity between expectations at school and at home. With very bright students, parents sometimes are loath to exercise the firmness and supervision that any growing child needs.

Whatever the program adopted, the able students need well-rounded experiences; physical activity, handicrafts, art, music, drama, and group endeavors must not be sacrificed for a too-exclusive preoccupation with symbols. Their need for affection, approval, and social participation is as great as anyone else's. Too often they suffer the pangs of feeling "different" and find that their difference brings them isolation rather than satisfaction. Both the bright and the dull need the psychological nurture that comes from a warm, interested, sympathetic teacher.

They are first children and youth and *then* special pupils with differential needs.¹¹

The matter of special abilities

There is yet another aspect to ability: the particular talents which an individual may have. We often remark about young children—or older ones—that they seem to have a gift for mechanical things, mathematics, art, or music. Some researchers have found that overall intellectual superiority and these other talents go hand in hand; other studies find them independent. Whether or not the two invariably go together there is no question but that the presence of superior intelligence aids in the utilization of a special talent.

Often, when these talents are exceptional, they “will out” regardless of what the school does, unless it is outright repressive. Sometimes, however, they are not so obvious and the school must search out potentials which will be a source of satisfaction and pleasure to the individual even though they do not place him in the gifted category. Performance is still an important cue, though tests may be employed, such as those available for assessing musical and artistic talent. The important thing for teachers in special areas to recognize is that there may be tonal “idiots” and “geniuses” in the same required music class. High general intelligence does not necessarily indicate high capabilities for these classes. And pupils who have less to contribute in the academic areas may sometimes find these other classes a place where they can shine.

EDUCATIONAL READINESS

Because so much school learning builds on previous learning, even an adequate developmental level and adequate potential do not ensure that a pupil will be ready for the learning planned for a given grade or for a particular subject. A child with a mental age under six may not be able to learn to read. But even with a mental age of seven or eight he will not learn to read unless certain things have happened to him. For example, he needs to have developed a certain skill in understanding and using language, in differentiating similar sights and sounds, in identifying with characters in a story, in grasping relationships of time and space and cause and effect.¹² Children entering first grade vary enormously in the degree to which they have perfected these skills at home. Some homes provide much more opportunity than others. The teacher's first job is to assess each child's proficiency in these prereading skills.

The same sort of thing is true at any grade level. Some past knowledge and background are needed for each new learning. If a textbook is designed for an eighth-grade vocabulary and comprehension level, then reading skill at this level is a prerequisite. Computation skills follow one upon another. Skills in working cooperatively, reading critically, and studying independently are needed for some

¹¹No one is happy with the present recognition given to individual differences. The problem is discussed at length in *Individualizing Instruction*, N.S.S.E. 61st Yearbook, Part I (Chicago: National Society for the Study of Education, 1962).

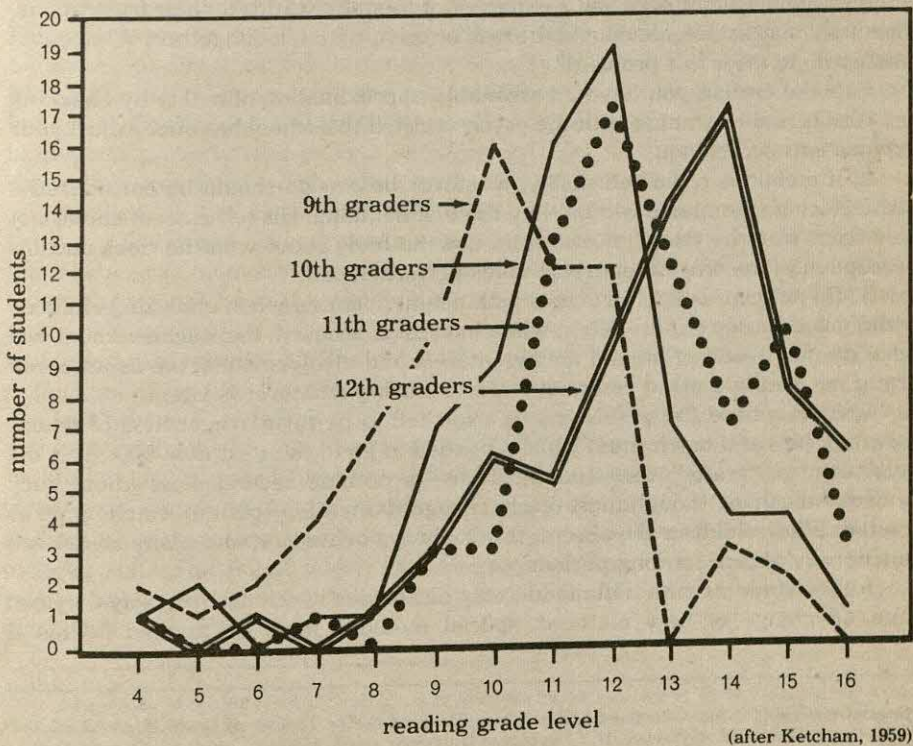
¹²How readiness for reading develops step by step at home and at school is discussed by Marion Monroe and Bernice Rogers in *Foundations for Reading* (Glenview, Ill.: Scott, Foresman, 1964).

types of learning. In the case of some school tasks, considerable work has been done in identifying the concepts and skills a pupil needs for readiness to move ahead. With others, we have hardly scratched the surface. Many people assume that children grow more alike in their achievement as they are taught through school, but nothing could be more erroneous. In the second grade, achievement level may already range from low first- to sixth-grade levels. By the fourth grade, there are still likely to be some children at the first-grade level in achievement but others in the class will range as high as the ninth-grade level (Hildreth, 1950; Tyler, 1960).

The chart below gives the findings of a study of reading achievement in a school whose students were generally above average in ability. It is apparent that although the *average* achievement level moved up somewhat each year during high school, the *range* remained about the same—about thirteen years, from fourth-grade level up through fifteenth- or sixteenth-grade level (Ketcham, 1959). If the test used had not had a ceiling of grade level sixteen, it is likely that the range would have been found to be still wider for the eleventh- and twelfth-grade classes. In the ninth grade, 7 per cent of the students are already achieving at a level above that of 56 per cent of the eleventh-graders.

From these findings, it will be apparent that in planning learning activities, the *average* achievement level of a class is less important for a teacher to know

READING ABILITY OF HIGH-SCHOOL STUDENTS



than the *range* of their achievement—and hence of their readiness for new learning. Even though the average reading level of a class is about eleventh grade, books written at the eleventh-grade level of difficulty may be suitable for less than half the class—not challenging enough for those reading at higher levels, and far beyond those reading at the eighth- or ninth-grade level. The latter students need to have material at their own level. If given material beyond their level, they simply learn less of it (Morse, 1951).

In the same way, practice on arithmetic processes that one does not understand or lacks the prerequisite skills to carry out is as useless as practice on processes that one has mastered and gone far beyond. A fifth-grader who cannot yet add cannot be expected to manipulate fractions.

In any curriculum area where learning must build on previous learning, the teacher's job is to know the sequences of steps in understanding and skill that must occur. Then, by identifying a pupil's present position, he can decide on the "next step" to be tackled and can set tasks at which there will be a probability of success. Step by step, in this way, a child whose educational readiness is below the level that his mental age would make possible can be brought closer to the point where he will be ready for the learning expected at this developmental level.

Obviously a teacher cannot give a pupil 10 points more of IQ or instant background for a particular new task. Even making a child eager to learn will not make him able to learn if he lacks prerequisites. But a continual frontal attack when students cannot do what is expected of them only adds to their frustrations. Thus they may seek to devalue the task or escape from it altogether. What can a teacher do to meet this problem?

1. Make certain you have a reasonable approximation of ability by checking test results and consulting with the psychologist, if the school has one. Adjust your expectations accordingly.

2. If a child is of limited ability, whatever he *can* do should be considered a satisfactory performance without any trace of belittling. His self-esteem comes not only from what he does but also from how he feels about what he does and his perception of the way others react to his performance.

3. Do not confuse performance with actual potential when analyzing children with limited backgrounds. Often, when interest is aroused, their achievement will belie the test result of limited ability. Interest and involvement serve as an accelerator, activating unused potential and maximizing whatever is latent.

4. Start where the pupils can be expected to perform—regardless of where that may be—and teach them what is needed to go to the next new task. It is the only way to "ready" the student. There is nothing second class about such remedial teaching, though most teachers regard any time spent on catching up as wasted. When children are absent, this is always necessary, and many have been functionally absent for long periods.

5. For students with definite learning disabilities which limit the way they can take advantage of new material, special methods must be applied.¹³ This is

¹³Special methods for use with these children are discussed in *The Teacher of Brain Injured Children*, W. M. Cruickshank, Ed. (Syracuse, N.Y.: Syracuse University Press, 1966).

particularly true in the area of reading and arithmetic skills where it is all too easy to pass students along, awaiting a maturity which will never come.

6. There are many, many times where the rigid, prescribed, universal curriculum must go, sometimes for the whole class, but at least for those who are at the high or low ends where the fit is poorest.

WHAT IS MOTIVATION?

We have thus far discussed the problems that must be considered prior to efforts to induce motivation. The facts of the case are wide differences in readiness of pupils for given tasks at every grade in the school continuum, both in level of ability and in the learning of prerequisite material. But suppose the teacher has assured himself that capacity is not the problem. Expectations are reasonable. Then what can be said of motivation?

In the simplest terms, motivation is what lies behind our behavior—the reasons we do what we do. “Now why in the *world* did you do that?” an exasperated mother will ask her three-year-old who has just emptied a box of cereal all over the kitchen. “*Why, why, why?*” the parents of a wayward youth will persecute themselves when their teen-age son, so lovingly and carefully nurtured, commits an act of delinquency and is called into court.

Psychologists have a somewhat more precise definition. Lindsley (1957) defines motivation as “a combination of forces which initiate, direct, and sustain behavior toward a goal.” Note that by this definition motivation not only instigates behavior but also operates to reinforce ongoing behavior. Different psychologists have different concepts as to the nature of these forces that initiate and sustain behavior. Combs and Snygg (1959) see behavior as powered by a continuing attempt to preserve and enhance self-concept. For Guthrie (1952), motivation is simply “the condition which increases the vigor of responses.”¹⁴

Applied to the classroom, motivation is what pushes a student to try to learn—or to expand his energies in other directions. In the traditional language of the teacher, “to motivate” means *to get the student to apply himself* to the learning at hand. Even more basic than getting students to apply themselves is getting them to *want to learn*. With a desire to learn, there is almost no limit to what teacher and class can accomplish. Without it, the teacher may open doors and provide opportunities for new experience and understanding all to no avail.

In Chapter 1 we talked of some of the characteristic motivational patterns of children. And yet we know that in addition to these long-term, intrinsic approaches to life—as represented, say, by achievement motivation—there are countless vacillations almost moment by moment. The selfsame pupil works in one subject and not in another, or at one time and not another. It is all well and good to dream of deep self-involvement which carries every pupil every second of his school career but a teacher who dreams thus had best not expect to see his dreams come true.

¹⁴For a summary of recent research, see *Current Research in Motivation*, by R. N. Haber (New York: Holt, Rinehart & Winston, 1966). A good general discussion will be found in *Personal Causation*, by R. de Charms (New York: Academic Press, 1968).

For observation

MR. ROTH WORKS AGAINST ODDS

Mr. Roth had been an excellent student and earned honors in his academic work. His interests were broad and for two years he had taken courses in many fields before settling on the humanities. He was intrigued by psychology but found English literature even more satisfying. Combined with his academic interests were a deep interest in people and a concern for their welfare. He gravitated toward teaching, was very involved in his preparatory courses, and found his student teaching exciting and rewarding. Here he taught a literature course in the eleventh grade under the direction of an able supervising teacher. The children were bright, upper middle class, and college bound.

Mr. Roth applied for a position in a well-paying metropolitan system. Once accepted, he was anxious to get his assignment, to go out to see the school, and to get organized. But things dragged along until the older teachers had decided on their changes, and it was not until a week before school opened that he knew his location. If the sight of the battered building, the run-down neighborhood, or the cautions he received about locking his car dampened his enthusiasm, no one would have known it.

He received his assignment—six classes a day in English and speech. His extracurricular assignments were supervising the school paper and planning certain assembly programs. A course of study was supplied for each of his classes. The outline was complete even to the day-by-day content he was to cover. His supervisor made it clear that the master plan was to be followed exactly, explained his other duties, and told him to call for assistance if he had any trouble. His principal, a career educator, had long since decided “you can’t fight City Hall” and had issued his replica of the “downtown policies” from time to time. He wanted no trouble with parents and no innovations. The first teachers’ meeting revealed a staff of forty. Some were new and some old-timers, counting the years until retirement.

Mr. Roth will never forget the first day. *Those kids!* They were quite a change from the youngsters he had known. Their language was colorful but hardly English. Profanity was sprinkled here and there, and once in a while there would be a raucous outburst and verbal sparring. They took the whole educational process with a light touch. They listened to what was expected of them without any conviction or involvement. There were a few sullen “hoods,” but most of the youngsters were light-hearted adolescents, given to whispering, giggling, and laughter. Their vigorous animal spirits had an appealing quality, and Mr. Roth warmed to them at once, but in his heart was a deep dismay about communicating to them the glories of their literary heritage. For their part, they easily accepted him, after testing him out with the declaration that they had run out two teachers last year. He replied that he was here to stay, and his certainty ended the testing. They liked him, openly admired his clothes, and responded to his personal interest in them. They soon found he was their friend and came to him with everything from personal problems to homicidal declarations against some of the other teachers. He listened, advised, and represented a positive but not dominating or moralistic point of view.

But it was in the course work where the real struggle took place. Most of them expressed a verbal intention to comply with his assignments—but somehow they always forgot. He just couldn't get them interested in Julius Caesar. Television and the latest movie were more inviting. When they tried to act out the parts, he found they just couldn't read them. They had never seen a play on a stage, let alone a Shakespearean production. When Mr. Roth tried to purchase special tickets for a matinee performance of a play, attendance was blocked by red tape from "downtown." He then tried without success to get a movie, but finally did get some recordings. Some of the students began to respond, saying, "I dig this stuff better now."

Mr. Roth soon discovered that he had to learn a whole new language before he could communicate with his charges. Before he could start developing their appreciation of basic English, he had to have them translate such terms as those in the following list, which was compiled by a teacher at a school for delinquents. Some of them could be converted only into other idiomatic expressions.

a vine (a suit of clothes)
 to peck (to eat)
 poke, iron, gold, bread (money)
 shucking (handing a line)
 a dooley (a juke box)
 a hing (a job)
 a rag, threads (clothes)
 a gig (a dance)
 I can gig (at a party I will be the personality kid)
 I need a slat (loan me a dollar)
 playin' up to the man (trying to manipulate an adult)
 the crib (the house)
 my wagon or sheen (my car)
 I'm gonna front him (I'm going to call his bluff)
 he knows the haps (he understands what is going on)
 come on in (do you agree with me?)
 cop my plea (begging for mercy)
 cop some Z's (get some sleep)
 you people are messin' over me (I'm being exploited)

The course of study which he was expected to teach was impossible. The only kind of English composition assignment that seemed to inspire them was writing for the school newspaper, and even here the results bore little relation to the approved style. The content of their articles ran mostly to gossip, except for an occasional diatribe against the police. In general, homework assignments were ignored—with *savoir-faire* rather than animosity. It all seemed so useless to them. Their outside reading consisted of comics or "hot-rod," movie, and picture magazines. Grammar exercises were lost on them.

Since the principal ran what he termed a "taut ship," there were relatively few severe discipline problems if you let the boys and girls alone. A few would show frustration when a request was made, when a failing grade was given, or when their side conversation was stopped, but the cold war between youth and

teachers—or between subculture and school culture—was well policed. Mr. Roth's sincere interest in his students made his class an oasis.

As the months wore on, Mr. Roth became more and more disheartened about his prescribed course of study and more and more interested in what really could be done for these young people. But every time he tried to change the work and introduce more flexibility, the pupils were perplexed and his supervisor was critical. He felt he needed to know more about the attitudes of the pupils and, with another new teacher, made up some very simple questionnaires concerning discipline, interest in school, expectations in life, what they wanted for themselves, and so on. These were tabulated in class and put on the board. The results underlined economic problems, delinquency, sexual freedom, and a common wish to leave school. The youngsters had highly practical goals and saw little value in school experience.

As spring approached, he looked back over the year with many vivid recollections. There was the problem of censorship over the school paper. The faculty had tried to make it more "middle-class" and had struggled constantly to reduce the sexual innuendoes and the boy-meets-girl columns. The staff had had quite a debate over the girl elected most popular in the school—she had been pregnant out of wedlock, had her child, and was back in school. She was attractive, bright, and not at all upset by her behavior. She was a school leader. But the principal felt that the election should be vetoed for the good name of the school. Of course, the students protested and made an issue of it, but the establishment had its way.

Mr. Roth remembered, too, the occasions when he had felt totally alone—trying to lead pupils who did not follow, trying to change a school that would not give an inch. Yet he liked working with the youngsters. He was not thrown into a panic when they spoke of their sexual behavior or of home conditions. He was not upset when he caught a boy smoking too close to the school. He liked them and wanted to help them. True, there were a few he had had to "kick out" of class, and there were days when he thought the whole enterprise hardly worth the struggle. But there were other times: when the students brought in something they had seen or heard about, or when he could get them to watch a worth-while dramatic production on TV. Then they had a class discussion that seemed to have meaning for them. But only rarely could he get them to do anything else outside of class. Twice, however, there were significant events in the community—one involving the police and the other a renters' strike—which, used as the basis for discussion and a little writing, demonstrated that these students were far from incapable once their interest had been aroused.

The more clearly he understood them, the less the goals he had assumed valid seemed appropriate for them. The time they had practiced how to interview for a job—taking turns being the boss and the applicant and analyzing the "speech"—had been successful. But a good deal of the time teaching had been nothing but going through the motions. He concluded that the students were, for the most part, able to do reasonably good work. The problem was motivation. The prescribed curriculum simply did not inspire them to put forth much effort. But there was no bag of simple motivational tricks to provide an instant solution. As Mr. Roth reviewed what he had learned of motivation in his first year of teaching, he realized that this was the cornerstone on which he must build in future years if his teaching was to be relevant to his students and satisfying to himself.

Mr. Roth's first year of teaching was perhaps not a typical one—but a thorough grounding in the psychology of motivation is essential in any teaching situation.¹⁵

MOTIVATION FROM THE TEACHER'S VIEWPOINT

In one school, the authors found four basic approaches to the problem of motivation. One teacher regularly resorted to physical punishment with a paddle he sarcastically called "the board of education." Another teacher had the reluctant learner stand facing the blackboard until he was ready to do what and as the teacher had asked. A third teacher remained after school to confer and counsel with pupils who were not responding in class. A fourth teacher made no effort to stimulate those who were not interested in learning. He even went so far as to ignore them when they cradled their heads in their arms and went to sleep. These teachers were exponents of the hard sell, the soft sell, and no sell at all.

In our discussion of motivation, we presume that as a teacher you will be interested in "selling" learning and will, therefore, want to know as much as you can about establishing in your pupils the desire to learn.

To see what practices teachers do use and to analyze their effectiveness as motivators, the authors conducted a survey of several hundred teachers, asking them how they motivated their pupils. Frequently, the teachers were at a loss to explain what they did. In general, their explanations were oversimplified and belied the subtlety of the actual teaching skill the authors observed. However, their explanations will serve as a useful point for beginning our study of motivation in the classroom.

Expectations

A good many teachers say they motivate pupils by *expecting* them to work. Schools are for learning; they never intimate that it might be otherwise. Such teachers speak of motivating by giving an assignment, asking a question, or presenting interesting information. In their opinion, most pupils really like to learn and, in general, enjoy working. All the pupils need, they believe, is to be guided through proper tasks reasonably set by an understanding teacher.

"I find something that interests him," is a frequent comment. These teachers tend to feel that there is enough intrinsic interest in most school tasks to motivate the average student. Usually these teachers also impart a feeling that success is possible.

There is research evidence to indicate that one does respond, at least in part, as one is expected to (Rotter, 1955). In one class, pupils will perceive that they are expected to work and will behave accordingly, while in another they will sense that they can get by with very little effort and, again, will do just about what is expected of them.

¹⁵For powerful first-hand descriptions of teaching experiences in lower-class schools, see *Death at an Early Age* by Jonathan Kozol (Boston: Houghton Mifflin, 1967) and *36 Children* by Herbert Kohl (New York: New American Library, 1967).

Probably the teachers who are effective with this method underestimate the importance of their own security in their work, their ability to gauge the nature of their students, and their ability to impart the feeling that pupils and teacher are engaged in a joint effort toward worth-while achievement. But the total set or expectancy that they manage to establish is very important.

The carrot and the stick

Other teachers do not expect school tasks to be self-motivating. They feel there is not enough intrinsic interest in most school tasks and that pupils must be either enticed to learn by promises of enjoyment and reward or forced to learn by pressures and the threat of failure – sometimes both.¹⁶

A good many teachers report that they motivate pupils through tests, grades, and eventually fear of failure. "If you don't want to take this over again next year, you had better get to work now," is the spoken or unspoken threat.

Tests can be valuable devices for self-evaluation, and mild pressure certainly activates many a reluctant scholar – though not every one by any means. But tests are not always used for self-evaluation, and as pressure mounts, the results are not always precisely the ones desired. Some pupils work harder and harder to do what is demanded of them; others become discouraged and give up; still others become rebellious and look for ways to retaliate against a system that makes them so uncomfortable. When competition is stressed, cooperation and mutual encouragement among pupils are not likely to develop.

Few teachers knowingly induce pressure to the point of producing real anxiety. Yet many teachers evidently make pupils overanxious without realizing it, for examination tension and fear of failure are all too common among students. What such fear-producing stress does to pupil-teacher relationships was demonstrated in a classic experiment by Murray (1933). He found that when preadolescent pupils were made fearful before being shown a series of pictures, they imputed more maliciousness to the adults shown in the pictures. Teachers who cultivate fear can expect to be perceived as threatening. This response may broaden to a fear of school in general and a dislike of all school activities. We know, too, from other studies that when an individual feels seriously threatened his perceptions narrow, his responses become more rigid and less flexible, and he tends to become defense-oriented rather than task-oriented.

Pressure has another unfortunate result. It relieves the student of responsibility for his own learning. In working to meet the teacher's demands, the learner may fail to develop any feeling of responsibility for directing his learning or for setting up standards for himself. Instead of being self-propelled, he is dependent on an outside authority to keep him task-oriented. In fact, many college students who have never learned to plan and direct their own learning say that they need frequent tests to make them do the work. When such students first encounter a situation in which they learn because of their own seeking, their satisfaction is dramatically different from the feelings they have had under pressured learning.

¹⁶In fact, the whole intrinsic and extrinsic motivation dichotomy is probably an artifact: both are required in a practical sense. For a discussion, see "Intrinsic and Extrinsic Motivation – A regrettable distinction" by D. L. Avila and W. W. Purkey (*Psychology in the Schools*, 1966, 3, 206–208).

Many teachers report that they try to motivate by making the results of the pupil's effort satisfying and pleasurable. Teachers who try to make learning satisfying use a wide range of devices for recognition and acknowledgment of work well done. Praise is their keystone. Sometimes they report using more concrete rewards, such as a special library period for those who do well or a period of free discussion on Friday if the week has been a good one. Stars by one's name on the board, honor lists, and special recognition days for superior achievement are other examples. Marks are treated as symbols of reward rather than as producers of fear.

Teachers and psychologists alike have long emphasized the importance of rewards, as we saw in our discussion of B. F. Skinner and operant conditioning in Chapter 6. Many experimenters have found that incentives can stimulate learning in both animal and human subjects. Rewarding a correct response increases the likelihood that it will occur again, as has been extensively documented by the operant conditioners. But even such an apparently simple motivation device as teacher "praise" or "blame" is enormously complicated and may have varying effects under different conditions. Over forty years ago, Hurlock (1925) found praise to be more effective than blame in motivating pupil effort. But since this pioneer study, it has been discovered that a number of qualifications must be added to her conclusions. For example, it makes a difference who administers the praise or blame (Schmidt, 1941). If the person is one held in high esteem, praise can be potent, but if the person is looked down on, blame from him may be regarded as more desirable than praise—as proof that the recipient is not in the "enemy camp." Praise from an unpopular teacher may thus have a negative result. Praise perceived as insincere or unearned is also ineffective.

The recipient's personality is an important factor, too. In experiments with fifth-grade pupils, Thompson and Hunnicutt (1944) found that with the group as a whole *either* praise or blame was more effective than no external influence but that within the group, praise was more effective with the introverts and blame was more effective with the extroverts. These are but a few of the complications that arise when we try to evaluate the motivational use of praise and blame.¹⁷

Expectations, rewards, and pressures—these, essentially, were the three answers given by the teachers we interviewed to the question, "How do you motivate students?" Yet they obviously used far more intricate motivational techniques than they listed. Some were master psychologists who could take a passive or even negative class of thirty-five and lead it to learning.

Even though the teachers interviewed did not list interpersonal relationships as motivators, experience shows that such relationships are a prime factor. Perhaps without realizing exactly how they operate, many effective teachers depend on a personal relationship of mutual interest and confidence in which they provide emotional support and bolster the pupil's confidence in himself. Liking and admiring a teacher provides an incentive to do well and live up to his expectations. Undoubtedly, too, many effective teachers make learning satisfying by supporting the motivation already present in their pupils, by kindling new interests, and by seeing that requirements are suited to the capacity of their students.

¹⁷Some of the subtle factors determining the influence of teachers' techniques on pupil motivation are explored by H. Rosenfeld and A. Zander in "The Influence of Teachers on Aspirations of Students" (*Journal of Educational Psychology*, 1961, 52, 1-12).

MOTIVATION FROM THE PUPIL'S VIEWPOINT

One of the reasons that expectations, rewards, and pressures do not tell the whole story is that they describe only events on the teacher's side—teacher actions to propel students to effort and hence learning. For a complete picture we need to examine what motivating forces the learner contributes. These include both the desires, needs, interests, and strivings that he brings with him into the classroom and the desires, needs, interests, and strivings that are created through his experiences there. Over the first, the teacher has no control. Over the second, however, he has a great deal of control. The ultimate key to motivation in the classroom lies in pupil purposes and in the teacher's use of these purposes, rather than in any teacher technique in and of itself.

When asked why they do schoolwork, elementary pupils frequently give such answers as, "Because the teacher says so," or "Because it's fun." Some indicate that schoolwork is "supposed to be good for you" sometime in the future. Others say, "To pass." Probably most of us are so conditioned that the removal of grades, without the development of a substitute, would reduce effort.¹⁸ Secondary students usually give answers encompassing the desire to understand, the future value of going to college, or getting ahead in life. Or they say they work because they have to please parents or teachers. Those who are not motivated to do schoolwork say it's too hard, it's no fun, or they don't see any sense in it.

Physiological needs in the classroom

Psychologists commonly agree that much behavior is motivated by an attempt to meet physiological needs. Surely the teacher cannot ignore the importance of physiological motivation. Frequently, unsatisfied basic needs interfere with other motivations the teacher may try to develop. There are times when the need for a drink of water appears to dominate a pupil's behavior. A question the teacher poses in math or English is not likely to stimulate much response when a student is busily trying to sneak a bite of his lunch or is listening impatiently for the bell so that he may dash to the restroom.

1. *Hunger.* Hungry pupils are difficult to teach. With chronic hunger there is commonly restlessness, irritation, and unresponsiveness, and other motivations are slow to become activated. In areas of economic deprivation or in cases where working parents expect the child to shift for himself, this may be a real stumbling block for the teacher. Some schools have attacked this problem by providing breakfast for their pupils.

Even for teachers in more privileged communities these facts are pertinent. Teen-age girls, in particular, are likely to "skip" breakfast in an attempt to catch up on sleep or cut down their weight. In any classroom, tension mounts and aggression increases before meals. Every teacher recognizes the difficulty of the "11:30 period." Schools which stagger the lunch hour have difficulties in keeping

¹⁸A study investigating this assumption is reported by T. L. Hawk and L. M. DeRidder in "A Comparison of the Performance of Pre-graded Students with Grade-Motivated Students" (*Journal of Educational Research*, 1963, 56, 548-550).

the late eaters at their work. The conditioned-to-the-clock hunger drive overrides other motivations.

2. *Sleep.* Pupils who have stayed up at night watching television are likely to be motivated more by the need for sleep than by the need to learn. When a pupil is asleep at his desk, it is not always from boredom. Children who are given undue freedom often spend long hours at TV or other pursuits, putting off homework until the last minute, and then must meet their need for sleep during daytime hours.

3. *Sexual interest.* The sex drive is more complicated as a motivating force in school, partly because direct expression is not culturally acceptable. But in various ways, a diffuse sexual drive may influence school behavior. For example, cross-sex interest—as indicated by expressed preferences—drops through elementary school and surges during junior high school. By the seventh or eighth grade, concern about relating to the opposite sex usually occupies considerable pupil attention and effort. It becomes a factor to consider in the way committees are set up, in selecting personnel for projects, and in designing the extracurricular school activities and social life, to say nothing of the seating arrangement in a classroom.

The typical preadolescent boy will be uneasy when working with a girl, or a group of girls, on a committee. He may resort to tactics not leading to scholastic accomplishment. The adolescent, on the other hand, finds mixed committees more attractive than all-boy or all-girl committees. Teachers can arrange for boys and girls to work together and at the same time frankly discuss the common tendency to oversocialize. By such means as this, the teacher can mobilize work effort and set needed limits. Even so, work accomplished may not always be greater. Feelings about particular classmates or an individual's insecurity over his own sex role may make a particular mixed group nonproductive.

Wise teachers operate to modulate normal sexual interest, not suppress or eliminate it. When boys and girls are given opportunity for reasonable social relationships, this drive need not be too strong a diversionary force for most pupils. There will, however, be some students for whom interest in the opposite sex becomes such a dominant aspect that nothing else matters. Usually these are youngsters who are using sexual attraction as a method of obtaining recognition and acceptance. Until such personal difficulties are dealt with, it may be impossible for the teacher to motivate these pupils in other directions.

4. *Activity.* Another often-mentioned basic need is the need for activity. This shows itself in several ways. Sometimes the emphasis is on play, with the observation that the young of many species devote much time to play. Explanations range from release of built-up muscular tension to the acting through of various life problems. Regardless of explanation, activity is almost synonymous with the play of childhood and the games of youth.

The need for activity shows itself clearly in school when preadolescents are kept too long without movement. Chairs begin to shuffle. Many small movements take place. Recess becomes an explosion. Older pupils can sustain themselves for a longer time without activity, but they too welcome the activity of moving from class to class and of conversing with friends.

In many classrooms the teacher does not merely ignore the drive for activity, but tries to suppress and thwart it. Children are forced to sit and listen for period

after period in which, except for the teacher's voice, quiet reigns. Teachers often talk a lot and listen little. A most simple and useful check for a teacher to make is a time study on how much sedentary listening time his pupils put in. He may be quite surprised to discover the extent to which his classroom is dominated by "teacher talk." It is often possible to direct pupil effort more effectively by talking less. Programs which incorporate motor activity—and at times even play—satisfy this need and make room for other kinds of motivations.

5. *Curiosity and the need to explore and manipulate.* Harry Harlow (1953), in work with monkeys, has directed attention to an apparently basic need that has much in common with the need for activity and is of central importance to school learning. Monkeys learn puzzles and work at them for long periods without any reward except the manipulation itself. Such studies have increased our understanding of curiosity as a basic motivation in humans. Children, too, are always active in exploring their environment, though curiosity does not always lead to systematic understanding.

Seeing—visual manipulation, if you will—often appeals where words do not. But curiosity is often satisfied only by handling, smelling, or tasting for oneself. The youth who sees a basketball moves toward it, picks it up, and tosses or bounces it. When a science teacher demonstrates a model in biology, seeing is not enough. Pupils want to take the parts out and feel them. In many ways children show this need to touch and manipulate. A little child leaves a trail as he goes, touching—or grabbing—his way. Even with adults, the urge is so strong that there have to be signs, glass, and distance to enforce "don't touch" rules. Such curiosity is a natural lead-in to an educational experience, even though it may not provide sufficient motivation to see the project through. Bruner and Piaget have been leading exponents of capitalizing upon this natural tendency to "find out" about things.

There are many opportunities in school to take advantage of the triad of manipulation, play, and curiosity. Whenever possible, the school can give pupils a chance to see at first hand the object under study and, if feasible, to handle and manipulate it. This is easiest, of course, in laboratory courses or in classes like shop and gym. But almost every course has gadgets just as fascinating to pupils as Harlow's puzzles are to monkeys. The English teacher records an oral report for playback. The history teacher uses a movie or a radio program in a lesson. The French teacher uses recording and playback devices in the language laboratory. There are the teaching machines, previously discussed. Of course, gadgets can get in the way of the learning the teacher desires, but, properly used, they can function as useful motivating devices by providing opportunities for activity and manipulation and hence a greater measure of personal involvement.

Sociopsychological needs in the classroom

In most cases, basic physiological needs have been fairly well satisfied when children reach the classroom, and the behavior teachers see is apparently powered chiefly by other needs. Most children, for example, seem to put considerable effort into activities aimed at increasing their feelings of competence, worth, affection, and belonging. Most want approval and recognition from other children

as well as from the adults they admire. Most are concerned about their place in the groups to which they belong or the groups to which they would like to belong.¹⁹

Some psychologists assume that motives such as these must be derived in some way from the physiological ones. Others point to evidence that there may be a structure of psychological needs as "primary" and basic as the physiological ones.²⁰ Even where an activity—such as earning a living—starts as a means of satisfying some "primary" need, it may engender new interests and motivations that continue when the original motivating conditions cease. For example, Allport (1961a) suggests that the drive to do a "workman-like job" on an assignment may start due to some other driving force but become a goal in itself. A music course may require that students become familiar with certain classics, and the pupils may continue to seek out this type of music long after the course, with its rewards in credits and grades, is over.

One of the many attempts at classifying human needs is that of Maslow (1954), who suggests the following five levels of needs:

1. Physiological, tissue needs
2. Safety, protection from injury
3. Love, belonging, warmth, acceptance
4. Self-esteem, adequacy, feeling of competence
5. Self-actualization, fulfillment of potentialities

He calls them *levels* of needs, because it appears that the needs in one group must be usually minimally satisfied before those in the next group dominate behavior. With a satisfaction of both body needs and psychological needs for love, approval, and belonging, there is commonly a restlessness and dissatisfaction with "doing things the same old way" and an urge toward further development and use of one's potentialities, toward a broader understanding of one's self and one's world. There may be a reaching out toward others with a concern to help them. Here we have what looks very like the maturity we described in Chapter 3, and we can see now that to achieve such maturity one must be able to work toward meeting needs on all five of Maslow's levels.

Some youngsters in the classroom will be concentrating their efforts at the level of body needs and the achievement of minimum love and security. Others will be absorbed in unraveling the mysteries of plant life or space travel. The motivations that teachers can use or build will depend on the level of the needs that their pupils are most concerned about satisfying.

In trying to meet his needs each pupil, from generalizations based on his past successes and failures, has adopted certain goals and rejected others and has gradually built up a pattern of specific goals and techniques that seem most promising. Some events and experiences he has come to regard as desirable and useful, others as undesirable and unlikely to bring satisfaction. One pupil may have found that careful workmanship brings him increased self-esteem and

¹⁹For a good description of six of these drives and suggestions for ways teachers can build on them in the classroom, see "Pupil Motivation and Its Relationship to the Activity and Social Drives" by D. M. Bortner (*Progressive Education*, 1953, 31, 5-11).

²⁰See Section 6 of the Reference Manual for further discussion of psychologists' concepts and findings with regard to physiological and sociopsychological motivation.

approval from others. Another may have learned that he can attract attention by showing off and may know of no way to gain deeper or more solid satisfaction. Each one has worked out a set of strategies—the best he knows how—which make his behavior fairly consistent and predictable. This set of strategies we call his *life style*. His response to a teacher demand will depend on whether it is consistent with his own values and seems likely to put him closer to his own goals. If it is, he will accept it; if not, he will resist it.

Motivation is part and parcel of personality. It is not grafted on, but comes as a growth from within. Much of it is below the level of consciousness, so that the individual himself often does not understand why he acts and feels as he does. A child who has a deep but buried hostility toward his parents may have trouble following the teacher's lead as a parent surrogate. An adolescent may not understand his resistance to new material or may not even realize that he is resisting it. When there is a personality problem, there is likely to be a motivational problem.

The striving for self-enhancement

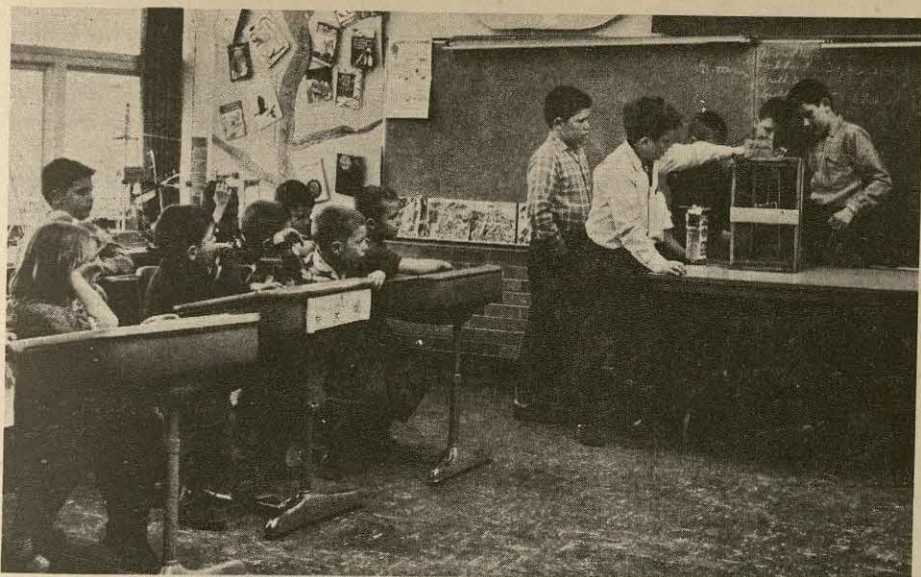
Teachers observe that most children operate to protect themselves from inroads on their self-esteem. Like people in any other age group, children do not want to be embarrassed, to feel stupid, or to be left out, and they resist attempts to make them feel so. They want to have a complimentary picture of themselves, and when the facts are unfavorable, they may try to improve the picture by rationalization or fantasy or other self-defensive mechanisms.

This selection and rejection of activities takes place on both conscious and unconscious levels. A boy may be driven to clown because he is unconsciously afraid people do not care about him and will pay no attention to him. He may do a mediocre job in school because he is afraid others will shun him if he becomes too good a student.

Each person develops a unique need structure in keeping with his self-image. When a task is seen as "baby stuff" or as "not my kind of thing," there will be little interest in trying to master it. When an activity is seen as alien to the self or as incompatible with it, there may be defensive behavior or active resistance. Girls sometimes react to chemistry or mathematics in this way, feeling these are "masculine" subjects.

Much motivational effort by teachers fails because the learning they are trying to foster does not serve the self-images of their pupils. Of what use is algebra to a pupil who sees himself as a truck driver? A child who sees himself as an impotent member of society, unable to influence anyone, does not readily become involved in learning how to be a good member of a democratic society. Sears (1957) found that attempts by either teacher or fellow students at influence in a direction that does not fit the scheme of the self tend to be resisted.

On the other hand, a pupil can readily be influenced toward an activity that contributes to his self-esteem. Anyone—child or adult—welcomes and seeks whatever he sees as making him more adequate, more capable, more admirable, more worthy. Here his activity is what we call *ego-involved*. Many studies have shown the advantageous effects of ego-involvement on both perception and learning: When a person feels that his status and worth are at stake in his per-



This picture shows a group of fifth-grade boys staging a science demonstration for a class of second-graders. The self-enhancement contingent upon serving as "teachers" for a group younger than themselves is doubtless a factor motivating the boys to do their job well. For the second-graders, on the other hand, the novelty of the situation is probably producing more interest and greater learning than would the same demonstration staged by their own teacher.

formance, he tends to mobilize his very best effort to make a creditable showing—whether it be in pulling off a robbery or in doing well in an accelerated mathematics class. The common denominator is that each person strives to protect and enhance his feelings of worth; his own unique self-concept determines what goals he will adopt and what rewards will make him feel worthy.

A pupil's self-image determines not only the *kinds* of goals he sees as suitable for him to strive for, but also the *level* of his aspirations. The more he expects of himself, the more effort he will put into achieving at a high level. If he sees himself as an "A student," he will tend to do whatever he sees as necessary for getting A's. If he sees himself as "the kind who always fails," he will pin no hopes on academic achievement and invest little effort in it.

Some pupils are rigid in their expectations, holding the same high or low aspiration in every subject. Others are more flexible, believing that they have a better chance of high achievement in some classes than in others. We hear pupils say, "I always was lousy in math but I'm pretty good in English." These compensatory patterns may or may not reflect actual ability levels.

Those whose feelings of worth are dependent on high achievement tend to set high levels of aspiration all across the board. Martire (1956) found that those with the highest need to achieve tend to rate their "ideal self" as more divergent from their "real self" than do others and that they often appear to be driven by an attempt to ward off feelings of inadequacy by achievement. From whatever source, a high motivation seems to facilitate learning more than practice in and of itself (Robinowitz, 1956).

Sometimes real aspirations are covered up by defenses. A boy who claims he doesn't care if he did miss all the words because he doesn't want to learn to read anyway may be only acting in self-defense: it may be less self-deflating to have people regard him as one who *chose* not to learn than as one who tried to learn but could not.

The boy who meets every appeal from the teacher with "I don't want to learn it" may be covering up a deep wish that he *could* master this baffling task, coupled with deep discouragement and a conviction of his inability. If so, what he needs is neither exhortation nor another failing grade, but first an experience of success to increase his confidence in himself and then help from the teacher in recognizing his real motivations.

Teachers are plagued with a minority—albeit a vigorous one—of students whose motivational difficulties are imbedded in a totally distorted personality. Problems range from the psychopathic child to the neurotic or sometimes psychotic one. It is hard on all concerned when these children must remain in the regular classroom. The problems they present will be discussed in Chapter 12.

The need for self-actualization

At all grade levels, teachers see evidences of the needs Maslow calls *self-actualizing needs*—the need to understand, to know, to create, to become what one is capable of becoming.²¹ There is a pleasure in knowing for its own sake (Asch, 1952). Teachers see children of all ages driven to learn just because they want to find out. In adolescence, there is frequently a search for meaning that motivates much learning. These youngsters may not go about the search in a manner resembling a philosophy seminar, but they ask some of the same questions that come up in more erudite groups. One child develops an all-absorbing curiosity about stars and reads everything he can get his hands on in this field. Another tinkers with electrical circuits.

Maslow points out that the strength of these "higher" needs, and the activities to which they lead, apparently vary greatly. One young person's ideal may be to be a good mother; another's, to be a good citizen. The child with interest and ability in art will find self-actualization through drawing and may overcome many obstacles to follow his artistic bent. The teacher who can activate such strivings finds teaching an exciting adventure.

One of the great mysteries is what happens to the insatiable curiosity of the little child as he goes through the school years. A few children keep their sense of wonder and their joy at finding out, but for many more, learning—supposedly their central occupation during these years—becomes dull, routine, and humdrum. Perhaps it is because their teachers have taken over too much of the responsibility. Too often teachers have substituted their own goals and inducements for the motive power of the children, and the children, for the most part, follow the course of least resistance and become dependent on the teacher to steer the course,

²¹A convincing case for the existence of basic, primary motivation toward *competence* in relation to one's environment is argued by R. W. White in "Motivation Reconsidered: The Concept of Competence" (*Psychological Review*, 1959, 66, 297–333). Dr. White also demonstrates the inadequacy of traditional theories of motivation based on animal studies and psychoanalytic concepts.

pose the questions, assign the activity, and prod them to action. Atkin (1958) compared the behavior of fifth-graders in a puzzling situation with that of second-graders and found that the older children, as a group, put forth fewer ideas of their own and were much more dependent on the teacher to tell them what to do. By high school and college, as already mentioned, it is common to find students who say they need frequent quizzes to make them do the work. They do not feel a responsibility for their own learning.

Olson (1959) points to a reaching out of "seeking behavior" on the psychological level. When children in a classroom are provided with materials of graded difficulty, they select the ones appropriate to their level of skill and keep choosing more difficult ones as their skill grows. They do not stay with the easiest material, as some teachers might fear, but keep choosing what challenges them.

It is understandably hard for teachers to wait for pupils to take the initiative. There is a crowded course of study to cover, and teachers know that their own teaching ability will be rated on the basis of how well their pupils do on achievement tests. They are acutely aware of the shortness of time, and they dare not leave achievement to chance or pupil whim. The quickest, surest way often seems to be to make available everything that is to be learned and then put students through the necessary motions for learning it.

Yet what one learns, as you have seen, depends not on the motions one goes through but on the experience that accompanies the motions. Teacher-directed motions may be meaningless to pupils. Ideas that come too fast cannot be absorbed. There is no incentive to put forth effort or thought when all the answers are provided ready-made before the questions have even been recognized. Nothing is left for youngsters to do but memorize—not much fun for anyone. So pupils learn to "put in time" at school and save their ingenuity for out-of-school endeavors. The Canadian Film Board motion picture *No Reason to Stay* is an excellent portrayal of this condition.

Utilizing the seeking behavior of children does not mean any abrogation of teacher responsibility for instruction. But it means cooperating with and building on what the student sees and is searching for. It means helping him set realistic, challenging goals, and guiding his efforts to reach them. It means cooperating with growth forces within the child, guiding and helping rather than driving him.

One way in which teachers can help pupils learn to take responsibility for their own learning is to present them not with a logically organized body of material to learn but with a puzzling situation to figure out—a set of questions instead of answers. Most human beings have a need to structure a strange situation, to make sense and see meaning, to put an unclear picture or idea into focus, to understand the principle underlying an apparent contradiction, to "learn the ropes." Irrationality, confusion, and uncertainty are disturbing and make us feel ill at ease and insecure; seeing an underlying order gives us a basis for prediction and hence for a feeling of adequacy.

KEYS TO MOTIVATION IN THE CLASSROOM

By the time they enter the classroom, children have acquired many simultaneous—and often conflicting—motives. Steve, a junior this year, is highly motivated

to achieve by doing good schoolwork. He is especially interested in history, and success comes easily to him. But he wants social recognition too. In his crowd, the higher his grades become, the less status he has in his friends' eyes. Meanwhile, his teachers, under pressure from the community, are trying to steer able students like Steve toward science and mathematics. And Steve's doctor father has made it evident that he would be inordinately pleased and proud to have Steve follow in his footsteps. Steve feels pulled in several directions.

Often teachers can release latent motivational potentials by helping young people unravel the complexity of their various involvements. Steve, with help in arranging the hierarchy of his values, may find that his varying needs can all be served in good time. Many young people cannot sort out what is to their best interests among the welter of stimuli they face. In the pleasure-seeking, money-motivated culture in which they grow up, many real values may lie submerged and unrecognized. A teacher who denies all but a few values *he* wants to promote may drive youngsters further from a solution. In this section we will discuss some aspects of pupils' striving that seem to be well-nigh universal. From them you can draw certain generalizations about motivation for classroom learning.²²

Learner goals versus teacher goals

Teachers who try to motivate by statements of expectations or by applying either the carrot or the stick are concerned largely with their own goals. But anyone—child or adult—exerts himself only as *he* sees some benefit deriving from the enterprise. Activity is not random but is directed toward some goal: a benefit is expected. Trying to motivate by pressures or rewards is an attempt to shortcut this process—to induce effort irrespective of any goal on the part of the learner other than the general preference for comfort over pain. But the *learner* must see a goal ahead if he is to put forth effort.

A teacher who simply assigns each hour's work without helping pupils to see the larger sequence of which it is a part or the purposes it can serve dooms them to fragmentary, short-term, unclear goals that will usually have little intrinsic appeal. This is the teacher who then feels a need for the carrot or the stick. He is giving students no opportunity to bring their existing motivations into the classroom in ways that could help their learning, and at the same time he is doing nothing to help them set up appealing goals in the work itself. John E. Ivey, Jr., has said,

... Today, in most schools and colleges, the teacher maintains the responsibility and initiative for the student's learning process. Students travel a road where records of attendance, grades, and course credits become the statistical mileposts of progress. . . . Such a system requires that the teacher always do things to and for the student. The teacher

²²A useful discussion of motivation in the classroom will be found in "The Teacher's Role in the Motivation of the Learner," P. S. Sears and E. R. Hilgard (Chapter 7 in *Theories of Learning and Instruction*, N.S.S.E. 63rd Yearbook, Part I. Chicago: National Society for the Study of Education, 1964). The definitive work on achievement motivation is *A Theory of Achievement Motivation*, edited by J. W. Atkinson (New York: Wiley, 1966).

becomes a sort of intellectual crutch. If the emphasis were shifted, the student would be guided as rapidly as possible toward a system of intellectual self-propulsion. This would produce the greatest latent teaching talent in the nation—the students themselves (1960, p. 57).

Even with entirely teacher-directed learning, learner motivation can be high, of course, under certain conditions. When the whole community places a high value on learning and students see their status as dependent on academic success, they may be highly motivated to do well. Or if schooling is hard to come by and they must overcome physical or economic hardships to get to school and stay there, those that come may be more eager to get the most out of it. Unfortunately, these are not common sources of motivation in our society. Schooling is available to all—whether they want it or not—and intellectual prowess is not one of our most prized virtues.

What the learner sees himself as getting out of an experience may be far different from what the teacher sees as central in the situation. But it is the learner's perception rather than the teacher's that determines how much effort he will invest and what direction his learning will take. His response to a situation—and the parts he will pick out and use—will depend as much on his dominant needs and values as on the features of the external situation. It makes a big difference whether he is most interested in getting an A, looking like everyone else, satisfying the teacher, or preparing for a future career. A pupil who is trying to figure out a puzzling problem and fit the details into a picture that makes sense will mobilize and apply his available knowledge and skills, search actively for missing links or needed information, try to fit it all together, and test his conclusions against what he already believes to be true, valuable, and possible. One who is chiefly concerned about getting a passing grade may put in enough effort to learn to make the desired responses on demand but may fail to make them a part of his central repertoire. One who is trying to show defiance of authority will probably not learn what the teacher wants him to learn at all.

Once a goal is adopted and progress toward it has begun, there is a tension to go the rest of the way, to complete the unfinished task. Just as a song half-sung demands the remaining part, or a game half-played would be unsatisfying, a school task in which the pupil feels involved has a momentum of its own. Pupils often show a relaxation when they hand in a project. It is done. The tension is reduced.

This drive to complete has been studied extensively and is a very real factor in the continuation of a task. What it suggests is that if you can help a student establish a clear-cut goal and a picture of a realistic path to the finish, he will have an impetus to go ahead on his own power to complete the task.

When there is no tension to complete, the pupil's chief goal has probably not been to do the task as a whole but only to go through a series of motions to gain a reward or avoid discomfort.

The tension to complete increases as one nears the goal. It is no wonder that pupils will ask for "just a minute more" rather than delay the finish until another day. When they are not given time to finish what they have become involved in, they are left with feelings of uneasiness, and potential motive power is thrown away. Schools that operate on a rigid time schedule do this repeatedly.

In the classroom examples in Chapter 2 and 8 you saw several examples of teachers using already-present interests and strivings for motive power for learning. But you also saw several examples of ways teachers can help youngsters build goals and interests beyond their original ones. No teacher skill is more important or more basic to a rich harvest of learning. How can new goals be built?

People tend to adopt as their own the goals and values of someone they admire greatly and with whom they feel a close identification. This is especially true of children and young people. So there is an important place in schooling for the presentation of models and images for life patterns. The contemporary idols of the entertainment and sports world seldom have the enduring quality needed by the adolescent. Through fiction and biography, students often encounter new kinds of images for identification. The history teacher can often stimulate a latent interest in politics by assigning articles and biographies about vivid political figures; the chemistry teacher can show the search for new chemical knowledge in the human terms of the scientists who have sought and found it. Teachers themselves are sometimes the most important models in a child's life, and they often find their enthusiasms, pet peeves, patience or impatience, and even mannerisms taken over by students who admire them.

Another way of helping learners adopt new goals—and one over which the teacher has more voluntary control—is by simply acquainting them with new possibilities. All of us are limited, in our choice of goals, to the alternatives we know about. The teacher can often stimulate enough interest and curiosity in a new, unknown topic to make pupils want to know more. Sometimes its utility to them or its relationship to something they already know and value can be pointed out; either attribute can increase its attractiveness. Then, like Mrs. Gable, the teacher can help them to clarify just what they want to know and what they need to do to find out. Often pupils are confused about just what is expected of them and why. It should be no secret.

Often children do not recognize their own potentials. When a teacher, knowing a child has the potentialities, says, "You can be an artist," ". . . a doctor," ". . . a teacher," the pupil may seize upon this new picture of himself and suddenly see new meaning in the stepping-stone tasks—learning to express himself clearly in writing, learning the chemical symbols. There is tremendous motivational possibility here.

Another way of inducing effective goals for learning is to encourage pupils to discuss possible objectives and plans of attack. A number of studies have shown that when members participate in the establishment of group goals, they then feel these goals are truly their own and are more highly motivated to achieve them than when an outsider determines their objectives.

Teachers sometimes assume that pupils come to school with the general goal of preparing for an adequate adulthood and citizenship. But young children cannot be expected to be motivated by the goal of preparation for life; indeed, senior classes in high school may just be beginning to indicate realistic motivation toward this goal. When a teacher reports a successful class project and states a lofty or long-term objective that was being served, it is very likely to be his perception rather than that of his students.

Many high-school students feel they have already spent long enough "getting ready"; they are eager to be holding real jobs and earning money. For such

students, combination work-study programs have proved useful. Part-time learning and earning in a job and part time in school in related classes can make the schoolwork seem more meaningful and worth while.

Not surprisingly, the goal of preparation for the future is most appealing to those who have the most extensive future time perspective. Teahan (1958) found with junior high school boys that the high achievers, as a group, had a more extensive future time perspective—tended to look further into the future—than the low achievers, who had a “short-range” or “emergency” orientation to the future. Despite such findings, the main motivational device used by teachers in many schools is an appeal to the future.

Although children are not often highly motivated by long-term goals, the goals they adopt will tend to be in accord with the future they see for themselves. The older the child, the less willing he is to accept a teacher-given goal when it is not substantiated by what he knows to be in keeping with his own future life. The difference in the response of youngsters to “practical” work in shop or typing as compared with “academic” courses often reflects their differential expectations for the future.

Success versus failure

Pupils for whom school learning has been satisfying and rewarding in the past will tend to approach a new learning situation with the expectation that this too will be a satisfying experience. On the other hand, those for whom school has been an alien, frustrating experience will have learned to seek their satisfactions elsewhere, deploying their effort and ingenuity in activities that seem to promise greater reward.

The confidence or lack of it that a child has developed in the past will affect his evaluation of his chances for achievement in the present quite as much as either his ability or the actual difficulty of the task (Klein and Schoenfeld, 1941). Those who have been consistently successful in the past tend to have realistic high expectations in a new task. But interestingly, those who have failed consistently do not necessarily have realistic low aspirations. Instead they are often either unrealistically low or unrealistically high in their expectations and aspirations in new situations (Sears, 1940; Gruen, 1945).

The teacher is always dealing with aspiration levels of yesterday and last year and often many years before that. A break from the past and a fresh start with new hope based on a more realistic self-appraisal may be needed. Often the biggest hurdle in doing remedial work is to give a child the confidence that he *can* learn. Many children who need remedial work are of superior intelligence but through repeated failure have become convinced that they are stupid and will no longer put effort into an activity that only makes them feel uncomfortable. Unwillingness to try is a pupil's way of expressing his low level of aspiration and his expectation of failure. Unrealistically high aspirations are equally damaging, of course, because no matter how good the performance, the child has a sense of failure instead of success.

Teachers sometimes wonder why the same grade will encourage one student, discourage another, and be blithely disregarded by a third. To them, an excellent

paper is a "success" and a messy one full of errors is a "failure," and they assume that pupils will have the same perception. But each person's feelings of success or failure depend on how well he achieves *what he was trying to do*. The student who was not trying to do a topnotch job anyway may have no sense of failure at a low grade, whereas the one who cannot bear to take second place will feel failure at an A if someone else gets an A+. As Barker has said,

the occurrence of success and failure experiences is independent of actual achievement: it is determined, rather, by the goals, expectations, and aspirations of the person at the time of the action. (1942, p. 222)

This explains the fact that poor performance on a task one considers far too difficult does not produce feelings of failure. By the same token, if the task seems too easy, objective success brings no feeling of successful achievement and hence no feeling of self-enhancement. Thirty pupils in a class will have thirty different self-images and thirty different sets of aspirations in keeping with them. They all need to experience success, because failure undermines their self-esteem. But the objective conditions that will induce feelings of success or feelings of failure will be as different as the thirty self-pictures.

Cumulative experiences of failure erase hope, and in self-defense a pupil will cease investing effort in what looks hopeless and only brings pain. Yet some failure cannot be avoided, and not all failure is harmful. Errors must be identified if corrections are to be made. As long as there is an anticipation of ultimate success, children can be taught to handle and profit from their failures, and their interest and effort can be maintained despite present failure (Gebhard, 1948; Tyler, 1958). It is only the sense of *inevitable* failure and the identification of oneself as "a failure" that paralyze effort and keep aspirations low.

Social factors in motivation

Our picture of the kind of person we are and our evaluation of our own worth and competence are strongly influenced by the reactions and evaluations of those around us and by the status and recognition they give us or withhold from us. Especially in childhood and adolescence, when we are still learning who we are and what we can do, other people's opinions of us carry strong weight in the picture we develop of ourselves. But even after the so-called "formative years," it is our face-to-face groups from which we get most of our feelings of approval, recognition, status, and affection. This is, perhaps, why the pressures of these groups are so hard to resist.

The social situation of the classroom affects pupil motivations in many ways. Teachers often find that pupils who are responsive as individuals seem to wear impregnable armor when they are in the group. At other times, children who are unresponsive to any teacher appeal will plunge enthusiastically into a project that has the support of the group. The codes and norms of a group can thus either facilitate or inhibit individual effort and may either support or work against the values the teacher is trying to promote. Chapter 9 focused on the ramifications of these group forces; here we will touch on only certain aspects related to motivation.

A traditional use of the group in school settings is as an arena for competition. "Who will be finished first?" or "Let's see who will get the most done," are pressure devices frequently used by teachers. The coach urges all the players to try to make the first team, and the music teacher holds competition for the first chair. Any adult who has to manage a group is not long in discovering the power of such competition. Pupils themselves are almost constantly examining the accomplishments of fellow pupils as a gauge to judge their own work. This happens even in schools where every effort is made to reduce competitiveness.

When competition is fostered between classmates and only a few can be successful, there may be a flurry of work. The teacher, seeing a "highly motivated" class, may be pleased at this flurry. But you have already seen the long-term consequences of failure on aspiration level. Today's sparkle gives way to tomorrow's doldrums. Many a teacher inherits a group with perpetual listlessness except for the few stars who long since vanquished all their competitors.

Competition between groups spreads the possibilities of winning, but it, too, has its hazards. Such competition becomes hard for many children when the failure of one means the failure of the whole group. The hapless member who misses the pass in football or fails the word in the spelldown may suffer agonies of rejection and antagonism from the rest of the group.

Some teachers have the idea that pupils will become "lazy" if not driven by competitive situations. The reverse is more likely to be the case in the long run, especially if the competition is so arranged that most must fail. Only as demands and expectations are realistic in terms of each pupil's potential will all pupils experience enough success to maintain high motivation.

Trying to foster competition among class members often boomerangs and actually diminishes the drives of the able student instead of increasing it. This is a very serious problem at a time when our country needs the maximum achievement from our most able. Let us see how it comes about.

In a cohesive classroom, there is a high degree of mutual identification of one student with another. Teen-agers in particular share this identification with each other against adults. When teachers introduce conditions where some students, by making high scores, cause the rest to look bad, they are creating an unnecessary and unfair conflict. Able students can do good work *or* be good group members but not both. They must give up one or the other.

The tendency is for them to do average work so as to become, as they see it, more typical and less threatening to the others. There is security in being in the middle of the group. On the other hand, the less able, to be average, aspire above their capacity and invite continued failure. We have already seen what a group can do to a deviant member, and the discomfiture that those who are "different" are made to feel.

In this phenomenon of attraction toward the group average lies the heart of the criticism that the schools are teaching mediocrity. The critics can see the results. This does not mean that they really understand what is going on, for their usual recommendation is more competition. Actually, of course, no teacher aims to teach mediocrity. Teachers want all their students to work as hard as they can. They are eager for quality of work to be commensurate with ability, and they recognize that abilities cover a wide range. But if the modern school wishes to emphasize the democracy implicit in differences, it will be necessary first to help

pupils see their differences as no threat to themselves. Most students feel free to set individual standards for themselves only in proportion as they can feel safe in being different.

One way of removing the threat from individual differences is to place competition on an individual basis, with each person competing at his own level. An example is provided by the experience of a sixth-grade teacher, Mr. Appleton. Mr. Appleton had been holding spelldowns with a common list of words. Suddenly he found his class losing interest in what had been a highly popular activity. Upon analysis, the reason was clear. The same students always came out on top. Mr. Appleton made up several lists related to the different levels of reading ability of his pupils. Teams were unobtrusively juggled so that pupils of similar ability competed in one group. In this way Mr. Appleton was able to change the goal from *the best* to *each one's best*. The pupils accepted the differential lists after a brief explanation and the tone of the class changed correspondingly.

Another way of overcoming the threat to status that children may see in the differences—especially superiorities—of their classmates is to help them appreciate the many different kinds of abilities that society needs. The children themselves can be involved in a consideration of how they think each one's best potentialities can be developed within their own group.

The Canadian Mental Health Project has demonstrated that freedom to differ can even be made a clearly specified and valued part of the group's own code. In this study, elementary-school pupils took part in a year-long series of class discussions in which they talked about whatever they wanted to and the supervising adult took no active part. As the pupils learned to express their true feelings without fear of rejection, they became more individualistic and divergent in their opinions. At the same time, there was evidence of increased mutual acceptance of each other's differences and—most important—of each other's right to differ.²³ In a case like this the group itself can give individual members support in seeking their own potential level instead of putting pressure on them all to conform to the group norm.

Instead of fostering competition, many teachers have developed cooperative designs to encourage learning. Some of these we saw in action in the classroom examples of Chapter 2 and Chapter 8. Generally speaking, cooperation produces less spectacular results than does competition. On the other hand, teachers who foster cooperative procedures are harnessing the motivation of social identifications instead of trying to fight against it. They also feel that the skills and attitudes gained in working together for the good of the whole are a valuable bonus that may never be acquired where competition is stressed.

Another social factor that seems to affect motivation is the degree of teacher domination of the learning activities. Here, too, relationships are evidently complex, and the studies have not given consistent results. One study comparing instructor-centered, student-centered, and eclectic groups found that learning was best under the eclectic method and that motivation was poorest under the student-centered arrangement (Kruboltz and Farquhar, 1957). In another study, lecture and teamwork methods were found to be equally satisfying on the average,

²³This project is described in *Promotion of Mental Health in Primary and Secondary Schools: An Evaluation of Four Projects* (Group for Advancement of Psychiatry, Report No. 18, January 1951, Topeka, Kan.).

but interesting individual differences were found. Students with low anxiety and high achievement at the beginning were less satisfied and made smaller gains than the others, regardless of the class design in which they took part.

Still another line of study suggests that a student's position on the dimension of dependency—independency has a great deal to do with the type of class design that is most motivating for him. There is evidence that dependent students are most comfortable and most highly motivated under an authoritarian arrangement, whereas the more independent students favor so-called democratic classes (McKeachie, 1954, 1958). That other personality needs play a part here too is evident from his finding that the teacher who provides clear structure and appraisal and substantial assignments creates the best-liked learning atmosphere for pupils with high achievement needs, while the teacher who emphasizes warmth and social recognition in the classroom is most desired by pupils high in need for affiliation (social relationships). The teacher who encourages self-expression and differences of opinion is especially likely to satisfy the pupil with a strong need for power.

Students with authoritarian personalities seem to have less trouble learning factual subject matter and more trouble mastering ambiguous material than nonauthoritarian students (Neel, 1959). In learning more effective reading, rigid, anxious college students were found to do best in directive classes (Smith et al., 1956).

All these studies illustrate the danger of making generalizations about the effect of external conditions or expecting the same condition or device to affect all children in the same way. The fact is that almost any motivational technique "works" with some pupils and "fails" with others. Large-scale group studies of new techniques often fail to show differential effects (Wallen, 1964), though for individuals within the group differences can doubtless be demonstrated. The importance of individualization cannot be stressed too strongly.²⁴

CULTURAL PROBLEMS AND MOTIVATION

After decades of disinterest, attention has been focused on deprived children, with particular concern for their motivational difficulties.²⁵ Sometimes they are treated as if they operated with a whole different set of motivations, unlike "typical" children. Such is not the case at all, as we have seen in the discussion of preschool programs. They, like other children, learn what their environment teaches them—albeit they exhibit the variation we have come to associate with human nature.

When a pupil comes to school unprepared, from an environment which has nothing in common with educational interests, of course he is "impossible to motivate" in the middle-class-oriented school, whether he is white or black, in the North or South. But when we list all the stigmata, we have only a statement of the problem for which an answer must be secured. We have already gone over the

²⁴For a discussion, see "A Study of Students' Motivation to Do Good Work in School" by Jack Frymier (*Journal of Educational Research*, 1964, 57, 239–245).

²⁵For a review of the problem, see "Education for Socially Disadvantaged Children" (*Review of Educational Research*, 1965, 35, No. 5).

basic information in this regard. The fact that the typical school is language-oriented and expects these pupils to identify with an unfamiliar set of values is the condition which needs alteration. The strength and potential of these children is evidenced by two things: (1) the resistance to forced failure which many show in place of capitulation to a sense of their own worthlessness; and (2) the many examples of their coming to life under the aegis of the skillful teacher even after a decade of failure.²⁶

Motivation for these children must be utilitarian, direct, and immediate. Success is of the utmost importance, for many do not believe themselves capable of anything but failure. While their language is colorful and expressive, it is often inadequate for general discourse and far from the vocabulary used in school material. To get through to these children, directions must be given with care, and direct experience substituted for verbal explanations wherever possible. Frequently they score low on tests of ability and achievement, which may incline the unwitting teacher to see them as dull. The teacher who does so creates an atmosphere of discouragement.²⁷ This is particularly true when all the children of a particular geographical area or social background are stereotyped as "deprived." Yet these children are not all alike. One may blurt out whatever comes to mind when the teacher asks a question. Another may need much encouragement to venture any response at all. To help the first, the teacher slows him down: "Before you answer . . ."; to help the second, extensive encouragement to get him to express anything at all may be needed.

The approach to teaching disadvantaged children is complex, as is any type of special education. Until a teacher is able to "feel" their lives, little is accomplished, for most teachers have been reared far from either urban or rural slums.²⁸ Suggestions for motivating these pupils cover much ground and are but a specialization of what the teacher would plan for any pupil.

1. Make certain that the classwork has a connection with the child's life experience, that the new has meaning in connection with the past. Never take understanding for granted.
2. Behave in such a way as to present a reasonable, interested adult image: otherwise the contagion of interest will never take place. Being really interested in the youngsters and their lives is the key.
3. Ensure success and reward accomplishments. Rewards must be visible —praising and valuing their productions. Clear, attainable goals must be set.
4. When sustained effort must be devoted to tasks with little intrinsic satisfaction, add external gratifications. "Free time" is one gratification any teacher can offer.
5. Incorporate activity into the learning tasks to take advantage of the need for motor activity.
6. Incorporate skill training at all levels. This may mean not only careful teaching of reading, but remedial reading as well; later on it may mean lessons in

²⁶See *Hooked on Books* by D. Fader and E. B. McNeil (New York: Berkley, 1968) for an example of the exciting results that can be achieved with these children by a teacher who cares.

²⁷For a discussion, see "The 'Successful' Child: Some Implications of Teacher Stereotyping," by P. Lambert (*Journal of Educational Research*, 1963, 56, 551-553).

²⁸For a picture of the kind of teachers these children need, see *Teachers for the Disadvantaged*, edited by M. D. Usdan and F. Bertolaet (Chicago: Follett, 1966).

how to study, outline, or take notes. Homework is often a poor way to get things moving; the important things should be covered in class.

7. Liaison with the parents through some school agency is most important.

The main thing one sees in such teaching is the unusual quota of teacher creativity it requires.²⁹

But there is another motivational problem one sees with older pupils, especially adolescents. They are often said to be alienated from school. Some are bright youngsters from favored environments who are especially sensitive to the sham and, as they see it, tarnished values of the "establishment." They rebel at an educational system which refuses to become involved with the real problems that surround it and at teaching which is mundane, supported by rules which have their roots in administrative convenience. Others are adolescents who feel that formal education is of no value to them (Lodato and Zweibelson, 1965). Some may be hostile, delinquent troublemakers. More are pathetically uninvolved, sitting passively. Their goal is to have "wheels," money, and freedom from academic demands. One high school in a middle-class area located over sixty such youngsters in the sophomore class—nearly 1 out of 8. Extensive counseling, remedial skill training, minimal class work, and job placement rescued many from the dropout list. While their education was not made easier by this change of curriculum, at least it was made possible.

This introduces the controversy surrounding the "middle-class school." But we will get nowhere if we talk about class distinctions rather than about social requirements of contemporary society in America. A pupil-centered school will not have lower-class youngsters saying, as one of them once did to one of the authors, "You know by the third grade you are different. You go to school but you don't count." Is it any wonder that by the last year of high school most of the upper-class youngsters are still in school while as many as nine out of ten of the lowest class may have left—the dropouts we discussed earlier? We cannot rest with conformity to superficial standards of any class.

When a neighborhood changes and a school previously drawing from a middle-class community begins to get children from a lower class, teachers often find it difficult to readjust their expectations. The authors have studied this process in several schools. In one, the teachers could not accept the idea that the lower-class children had more loose pocket money, more freedom, and long hours of TV while at the same time they needed dental attention, had poor diets, and came to school dirty. They could not understand how the children had no eagerness to do the work, yet were anxious to hang around after school to help clean up the room or just to loiter around the halls.

Not all value differences follow class lines. There have been many subtle shifts in our values in the past twenty or thirty years, some of which are not fully recognized. Certain values on which the schools have been built and on which school learning depends are not universally accepted even on the middle-class level. For example, the school holds that understanding one's environment is important for citizenship, that dealing with problems and symbols is worth while,

²⁹An excellent resource book on the subject is *Educating the Culturally Disadvantaged Child*, by L. D. Crow, W. I. Murray, and H. H. Smythe (New York: David McKay, 1966).

that one ought to work as hard as one can to produce the best possible product, that the diligent search after truth, whether in science or art, is a reasonable goal for men regardless of monetary return. Yet our culture is also extolling quite different values. All classes have members who disparage intellectual pursuits. To have pleasure, to be entertained, to be excited and stimulated, to seek after new thrills, to want the latest thing just because it is the latest—these values have come to be a significant part of our contemporary ideology.

What is a teacher to do when a boy in junior high school tells with obvious admiration how his father, by timing his coffee breaks and trips to the restroom, has figured out how to outwit his boss and get by on a minimum of work output—at full pay of course? What will such a boy's attitude be toward his homework assignments, and what should a teacher do about it? What should a teacher say when the son of a professional person reports with pride that his father usually gets a high price for very little technical work because most of his clients do not realize how easy it is for him to get the answers? Will such a boy extend himself to write the best possible term paper? If Mother and Father limit their reading to the society column and the sports page, why should Junior see any value in studying current events?³⁰

Despite the verbal support parents give to the idea of "strengthening the moral fiber by good hard work," it is apt to be their offspring they have in mind rather than themselves. Especially since sputnik, adults are quick to urge more homework and more rigorous standards for children, but they are reluctant to give up their own coffee breaks and other recreational patterns. Advertisements extol casual living, doing things the easy way, and making a good surface appearance. These attitudes seep through, and boys and girls—especially adolescents—are well aware what their parents' values really are. The educational erosion is not alone a lower-class phenomenon.

Fortunately, many things taught in school can carry their own appeal even to "deprived" youngsters if approached in the right way. Wars, political struggles, taxes, wages, and the history of ideas are not class-identified. Substantial art, music, and literature can touch a student so deeply that he finds himself working out a set of values of his own. Many pupils can find school activities an avenue to significant personal growth if the teacher makes certain to lower their defenses first. If youngsters do not feel personally rejected because of their ungrammatical language or dirty clothes or careless exuberance, their curiosity may carry them into an exploration and serious weighing of the new ideas and values they meet at school.

We are not left without direction if we take the essential requirements for social survival as our "classless" core. Ours is a verbal, language-oriented society. Reading is not a middle-class skill; reading is essential if one is to find one's way about, to secure a driver's license, to fill out government forms. Computation skills are needed for similar reasons. In a competitive society, salable skills are needed to get a job. Without reasonable work habits, jobs are lost. Can a voting society

³⁰The importance of identification patterns for bright pupils is discussed by T. A. Ringness in "Identification Patterns, Motivation, and School Achievement of Bright Junior High School Boys" (*Journal of Educational Psychology*, 1967, 58, 93–102).

afford ignorance? Can an activist society sustain itself on demagoguery? While many do get away with antisocial behavior, it is a risky career. Producing new generations without an awareness of child-rearing practices can bring agony to parent and child. The task of the school is not to make everyone over into the cartoon middle-class suburbanite. It is to help each person participate to a reasonable degree in the culture about him.

THE QUESTIONS OF OVER- AND UNDERACHIEVEMENT

The utilization of potential is a matter of deep concern to the school establishment. Theoretically, there is no such thing as overachievement—a person doing better than he is able to do—but there is such a thing as straining for achievement. Teachers often encourage this, accentuating parents' desire to have their offspring get ahead, be at the top of the class, and do outstanding work so that they can get into the "best" university. A student who does not do exceptionally well sees himself as a failure in his parents' eyes, hence in his own. In certain upper-middle-class environments this has become so common as to be termed "achievement neurosis." Children and youth of average ability whose parents have unreasonable aspirations for them are the hardest hit. Youngsters become obsessed with the race for grades, recognition, competitive standing, and lose sight of learning itself. Sometimes school achievement is rewarded by money or gifts. One parent asked a clinician whether he should give his son a car or a boat if he graduated with honors. The advice was neither. The parent ended up giving both. Material rewards are a *sine qua non* in our society to be sure, but it is no kindness to a child to teach him that this is why he should do schoolwork.

Teachers and counselors have two functions to perform, and each must be done with circumspection. One of these is helping the pupil know, in a general way, something about his own potential. He must come to be proud of and pleased with what he can be and do if he does his best. Since test scores are notoriously inaccurate, feedback must be given cautiously, of course. Teachers can also play down "grades for Harvard," emphasizing the satisfactions of knowing and discussing other values which pupils can and do recognize once they are brought out. Realistic information must be given to parents as well. If they have a fixation on academic success, this must be recognized as a deep-seated problem, not to be solved by a little advice from the teacher. Specialists must help the teacher in such cases. Incidentally, as certain lower-class parents come to see schooling as the way to a better life, they too make high demands on their children. As one child reported, "I gits a good 'port card or I gits whupped."

The other side of the coin is more often apparent: students doing much less than we presume they can do. Somewhere motivation has not been effective. We usually short-circuit the nature of the problem by equating academic potential with an IQ score and performance with achievement: Performance should equal ability. But as Thorndike has pointed out, "the aptitude test is, after all, only one sample of behavior from which another, usually larger and somewhat different sample is being forecast" (1963a, p. 3). Since neither ability nor performance tests approach perfection in validity or reliability, and since the correlations between

the two at best predict only two thirds of the variance, there is bound to be some discrepancy.³¹

In reality, the formula for achievement should include many variables:

$$\text{Ability} + A + B + C + D + E \dots = \text{Performance}$$

These additional factors represent such conditions as immediate motivation, readiness, skills, long-term attitudes toward school, family encouragement, peer support, and so on. Looked at this way, there is no such thing as underachievement. Each person does what he can, all the conditions being what they are. If we knew all of the conditions, we could predict with accuracy. The silver lining is that such conditions are not unchangeable.

In an interesting study which avoids the pitfalls of some previous work, Ruckhaber (1966) examined some of the factors operating in two groups of fourth-grade boys equated for intelligence. One group was high achieving, the other low. High achievers had a higher measured "need for achievement," were more involved with learning, had higher educational aspirations and a higher level of mental health, and were more often chosen by classmates for play and work companions than the low achievers. It is important to note, however, that there was no *single* pattern of variables for either the high or the low achievers. Subgroups of children within both groups showed somewhat differing patterns. The individuality of the combinations has to be appreciated in dealing with a particular pupil. Other studies found greater variability in adjustment among low achievers (Ringness, 1965; Rushton, 1966). Underachievers have also been found to withdraw, and to base their social relationships more on extra-curricular activities than on classroom tasks (Perkins, 1965).

An interesting study compared high-school groups classified as overachievers, normals, and underachievers. (Gawronski and Mathis, 1965). The overachievers had the most effective study habits and were more persistent and more interested, with a desire to work for grades. They were more responsible, better self-regulated, more accepting of authority, and had more leadership ability. In general, the underachievers were at the other end, with the normals in between but more like the overachievers. It must be emphasized that these are generalizations and much is still to be understood. There is evidence that teacher perceptions of the attitudes of good and poor achievers are not always accurate (Otto, 1965).

The special problem of the high-school underachiever and the dropout are linked, as we saw in Chapter 5. Nothing short of a viable curriculum, small classes, counseling, and work experience for pay can be expected to make any inroads. It should be pointed out that able but low-achieving students are often "pushouts"; perhaps as many as a third react against the school in their frustration and are then excluded by the school (Elliott, Voss, and Wendling, 1966). Pregnancy, delinquency, and dislike of school are the reasons that appear in school records. The school too often operates in such a way as to deprive such youngsters of status. They may drop out or they may become problem cases, fighting what they see as discrimination against them. This is particularly true of lower-class youngsters who must compete against more acclimated peers.

³¹E. S. Edgington has proposed quite another system which should be examined by those interested in this problem. See "A Normative Approach to Measurement of Underachievement" (*Journal of Experimental Education*, 1964, 2, 197-200).

Studies of able but under-achieving high-school students generally give us a picture of poor personal adjustment, less self-control, low self-acceptance, little participation in extracurricular activities, and poor school adjustment (Roberts, 1962). Remedial programs have included counseling as well as curriculum change with apparent success—especially in cases where personal problems were a major factor in underachievement (Davids and Andrews, 1964). On the other hand, counseling and remedial work do not always help elementary students (Winkler and Teigland, 1965).

Sontag and Kagan, in long-term developmental studies, have found that

The period from six to ten years is critical for the crystallization of desire for task mastery and intellectual competence. High levels of achievement behavior at that age are highly correlated with achievement behavior in adulthood (1963, p. 534).

They also feel that the teacher may play a critical role in stimulating the child's self-confidence, whatever his ability.

When pupils have gone as far as high school without acquiring the basic attitudes and motives upon which so much of academic achievement depends, it is most difficult to inculcate it. Certainly, lowering the grades for low production, giving additional schoolwork, or keeping a pupil after school will not help, even when parents support these efforts. The whole of adolescent psychology and motivational psychology must be brought to an intelligent focus on this task—which will require considerable effort and time and a high tolerance for frustration. There is no such thing as instant motivation, ready-made for the teacher to dispense to any student—especially not for those with complex problems.³²

Reading

Jerome S. Bruner

THE WILL TO LEARN

Here Jerome Bruner, one of the leading thinkers in the field of educational psychology today, talks about the nature of young human beings and the reasons they behave as they do. He identifies certain elements of motivation that appear to be innate—curiosity, the desire for competence, identification, social reciprocity—and shows that the teacher can and must capitalize on this “built-in” motivation if he wishes to lead his students to real and lasting learning.

The single most characteristic thing about human beings is that they learn. Learning is so deeply ingrained in man that it is almost involuntary, and thoughtful stu-

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³²Many useful articles will be found in *Mental Health and Achievement*, E. P. Torrance and R. D. Strom, Eds. (New York: Wiley, 1965).

dents of human behavior have even speculated that our specialization as a species is a specialization for learning. For, by comparison with organisms lower in the animal kingdom, we are ill equipped with prepared reflex mechanisms. As William James put it decades ago, even our instinctive behavior occurs only once, thereafter being modified by experience. With a half century's perspective on the discoveries of Pavlov, we know that man not only is conditioned by his environment, but may be so conditioned even against his will.

Why then invoke the idea of a "will to learn"? The answer derives from the idea of education, a human invention that takes a learner beyond "mere" learning. Other species begin their learning afresh each generation, but man is born into a culture that has as one of its principal functions the conservation and transmission of past learning. Given man's physical characteristics, indeed, it would be not only wasteful but probably fatal for him to reinvent even the limited range of technique and knowledge required for such a species to survive in the temperate zone. This means that man cannot depend upon a casual process of learning; he must be "educated." The young human must regulate his learning and his attention by reference to external requirements. He must eschew what is vividly right under his nose for what is dimly in a future that is often incomprehensible to him. And he must do so in a strange setting where words and diagrams and other abstractions suddenly become very important. School demands an orderliness and neatness beyond what the child has known before; it requires restraint and immobility never asked of him before; and often it puts him in a spot where he does not *know* whether he knows and can get no indication from anybody for minutes at a time as to whether he is on the right track. Perhaps most important of all, school is away from home with all that fact implies in anxiety, or challenge, or relief.

In consequence of all this the problem of "the will to learn" becomes important, indeed exaggerated. Let us not delude ourselves: it is a problem that cannot be avoided, though it can be made manageable, I think. We shall explore what kinds of factors lead to satisfaction in "educated" learning, to pleasure in the practice of learning as it exists in the necessarily artificial atmosphere of the school. Almost all children possess what have come to be called "intrinsic" motives for learning. An intrinsic motive is one that does not depend upon reward that lies outside the activity it impels. Reward inheres in the successful termination of that activity or even in the activity itself.

Curiosity is almost a prototype of the intrinsic motive. Our attention is attracted to something that is unclear, unfinished, or uncertain. We sustain our attention until the matter in hand becomes clear, finished, or certain. The achievement of clarity or merely the search for it is what satisfies. We would think it preposterous if somebody thought to reward us with praise or profit for having satisfied our curiosity. However pleasant such external reward might be, and however much we might come to depend upon it, the external reward is something added. What activates and satisfies curiosity is something inherent in the cycle of activity by which we express curiosity. Surely such activity is biologically relevant, for curiosity is essential to the survival not only of the individual but of the species. There is considerable research that indicates the extent to which even nonhuman primates will put forth effort for a chance to encounter something novel on which to exercise curiosity. But it is clear that unbridled curiosity is little more than unlimited distractibility. To be interested in everything that comes along is to be

interested in nothing for long. Studies of the behavior of three-year-olds, for example, indicate the degree to which they are dominated from the outside by the parade of vivid impressions that pass their way. They turn to this bright color, that sharp sound, that new shiny surface. Many ends are beyond their reach, for they cannot sustain a steady course when the winds shift. If anything, they are "too curious." They live by what psychologists have long called the laws of primary attention: attention dominated by vividness and change in the environment. There has been much speculation about the function of this early and exhausting tempo of curiosity. One neuropsychologist, Donald Hebb, has suggested that the child is drinking in the world, better to construct his neural "models" of the environment. And it is plain that a stunted organism is produced by depriving an infant of the rich diet of impressions on which his curiosity normally feeds with such extravagance. Animals raised in homogenized environments show crippling deficits in their later ability to learn and to transfer what they have learned. Children "kept in the attic" by misguided or psychotic parents show the same striking backwardness. Indeed, even the children who have suffered the dull, aseptic environment of backward foundling homes often show a decline in intelligence that can be compensated only by vigorous measures of enrichment. So surely, then, an important early function is served by the child's omnivorous capacity for new impressions. He is sorting the world, storing those things that have some recurrent regularity and require "knowing," discriminating them from the parade of random impressions.¹

But if attention is to be sustained, directed to some task and held there in spite of temptations that come along, then obviously constraints must be established. The voluntary deployment of curiosity, so slowly and painfully mastered, seems to be supported in part by the young child's new-found capacity to "instruct himself," literally to talk to himself through a sustained sequence. And in part the steadying force seems to be the momentum of concrete overt acts that have a way of sustaining the attention required for their completion by shutting off irrelevant impressions. In time, and with the development of habitual activities, and of language, there emerges more self-directed attention, sometimes called derived primary attention. The child is held steady not so much by vividness as by the habitual round of activity that now demands his attention. Little enough is known about how to help a child become master of his own attention, to sustain it over a long, connected sequence. But while young children are notoriously wandering in their attention, they can be kept in a state of rapt and prolonged attentiveness by being told compelling stories. There may be something to be learned from this observation. What makes the internal sequence of a story even more compelling than the distractions that lie outside it? Are there comparable properties inherent in other activities? Can these be used to train a child to sustain his curiosity beyond the moment's vividness?

Observe a child or group of children building a pile of blocks as high as they can get them. Their attention will be sustained to the flashing point until they reach the climax when the pile comes crashing down. They will return to build still higher. The drama of the task is only its minor virtue. More important is the

¹For a further account of the functions of early curiosity, see J. S. Bruner, "The Cognitive Consequences of Early Sensory Deprivation," *Psychosomatic Medicine*, 21.2:89-95 (1959).

energizing lure of uncertainty made personal by one's own effort to control it. It is almost the antithesis of the passive attraction of shininess and the vivid. To channel curiosity into more powerful intellectual pursuits requires precisely that there be this transition from the passive, receptive, episodic form of curiosity to the sustained and active form. There are games not only with objects, but with ideas and questions—like Twenty Questions—that provide such a disciplining of the channeling of curiosity. Insofar as one may count on this important human motive—and it seems among the most reliable of the motives—then it seems obvious that our artificial education can in fact be made less artificial from a motivational standpoint by relating it initially to the more surfacy forms of curiosity and attention, and then cultivating curiosity to more subtle and active expression. I think it is fair to say that most of the success in contemporary curriculum building has been achieved by this route. When success comes, it takes the form of recognition that beyond the few things we know there lies a domain of inference: that putting together the two and two that we have yields astonishing results. But this raises the issue of competence, to which we must turn next.

For curiosity is only one of the intrinsic motives for learning. The drive to achieve competence is another. Professor Robert White puts the issue well:

According to Webster, competence means fitness or ability, and the suggested synonyms include capability, capacity, efficiency, proficiency, and skill. It is therefore a suitable word to describe such things as grasping and exploring, crawling and walking, attention and perception, all of which promote an effective—a competent—interaction with the environment. It is true, of course, that maturation plays a part in all these developments, but this part is heavily overshadowed by learning in all the more complex accomplishments like speech or skilled manipulation. I shall argue that it is necessary to make competence a motivational concept; there is competence motivation as well as competence in its more familiar sense of achieved capacity. The behavior that leads to the building up of effective grasping, handling, and letting go of objects, to take one example, is not random behavior that is produced by an overflow of energy. It is directed, selective, and persistent, and it continues not because it serves primary drives, which indeed it cannot serve until it is almost perfect, but because it satisfies an intrinsic need to deal with the environment. (White, 1959)

Observations of young children and of the young of other species suggest that a good deal of their play must be understood as practice in coping with the environment. Primatologists describe, for example, how young female baboons cradle infant baboons in their arms long before they produce their own offspring. In fact, baboon play can be seen almost entirely as the practice of interpersonal skills. Unlike human children, baboons never play with objects, and this, the anthropologists believe, is connected with their inability to use tools when they grow up. And there is evidence that early language mastery, too, depends on such early preparation. One linguist recently has shown how a two-year-old goes on exploring the limits of language use even after the lights are out, parents removed, communication stopped, and sleep imminent (Weir, 1962).

The child's metalinguistic play is hard to interpret as anything other than pleasure in practicing and developing a new skill. Although competence may not "naturally" be directed toward school learning, it is certainly possible that the great access of energy that children experience when they "get into a subject they like" is made of the same stuff.

We get interested in what we get good at. In general, it is difficult to sustain interest in an activity unless one achieves some degree of competence. Athletics is the activity par excellence where the young need no prodding to gain pleasure from an increase in skill, save where prematurely adult standards are imposed on little leagues formed too soon to ape the big ones. A custom introduced some years ago at the Gordonstoun School in Scotland has become legendary. In addition to conventionally competitive track and field events within the school, there was established a novel competition in which boys pitted themselves against their own best prior record in the events. Several American schools have picked up the idea and, while there has been no "proper evaluation," it is said that the system creates great excitement and enormous effort on the part of the boys.

To achieve the sense of accomplishment requires a task that has some beginning and some terminus. Perhaps an experiment can serve again as a parable. There is a well-known phenomenon known to psychologists by the forbidding name of the Zeigarnik Effect. In brief, tasks that are interrupted are much more likely to be returned to and completed, and much more likely to be remembered, than comparable tasks that one has completed without interruption. But that puts the matter superficially, for it leaves out of account one factor that is crucial. The effect holds only if the tasks that the subject has been set are ones that have a structure—a beginning, a plan, and a terminus. If the tasks are "silly" in the sense of being meaningless, arbitrary, and without visible means for checking progress, the drive to completion is not stimulated by interruption.

It seems likely that the desire to achieve competence follows the same rule. Unless there is some meaningful unity in what we are doing and some way of telling how we are doing, we are not very likely to strive to excel ourselves. Yet surely this too is only a small part of the story, for everybody does not want to be competent in the same activities, and some competencies might even be a source of embarrassment to their possessors. Boys do not thrill to the challenge of sewing a fine seam (again, in our culture), nor girls to becoming competent street fighters. There are competencies that are appropriate and activating for different ages, the two sexes, different social classes. But there are some things about competence motives that transcend these particulars. One is that an activity (given that it is "approved"), must have some meaningful structure to it if it requires skill that is a little bit beyond that now possessed by the person—that it be learned by the exercise of effort. It is probably the combination of the two that is critical.

Experienced teachers who work with the newer curricula in science and mathematics report that they are surprised at the eagerness of students to push ahead to next steps in the course. Several of the teachers have suggested that the eagerness comes from increased confidence in one's ability to understand the material. Some of the students were having their first experience of understanding a topic in some depth, of going somewhere in a subject. It is this that is at the heart of competence motives, and surely our schools have not begun to tap this enormous reservoir of zest.

While we do not know the limits within which competence drives can be shaped and channeled by external reward, it seems quite likely that they are strongly open to external influence. But channelization aside, how can education keep alive and nourish a drive to competence—whether expressed in farming, football, or mathematics? What sustains a sense of pleasure and achievement in mastering things for their own sake—what Thorstein Veblen referred to as an instinct for workmanship? Do competence motives strengthen mainly on their exercise, in whatever context they may be exercised, or do they depend also upon being linked to drives for status, wealth, security, or fame?

There are, to begin with, striking differences among cultures and between strata within any particular society with respect to the encouragement given to competence drives. David McClelland, for example, in writing about the “achieving society,” comments upon the fact that in certain times and places one finds a flowering of achievement motivation strongly supported by the society and its institutions and myths alike (McClelland, 1961). Emphasis upon individual responsibility and initiative, upon independence in decision and action, upon perfectibility of the self—all of these things serve to perpetuate more basic competency motives past childhood.

But cultures vary in their evaluation of *intellectual* mastery as a vehicle for the expression of competence. Freed Bales (1944), for example, in comparing Irish and Jewish immigrant groups in Boston, remarks that the Jewish, much more than the Irish, treat school success and intellectuality as virtues in their own right as well as ways of upward mobility. The reasons can be found in history. Herzog and Zborowski (1952), in their book on eastern European Jewish communities, suggest that the barrier erected against Jews’ entering other professions may have helped foster the cultivation of intellectual excellence as a prized expression of competence.

A culture does not “manage” these matters consciously by the applications of rewards and reproofs alone. The son of the rabbi in the eastern European *stetl* was not punished if he wished to become a merchant rather than a Talmudic scholar, and, indeed, if he chose to become the latter he typically went through long, extrinsically unrewarding, and arduous training to do so. More subtle forces are at work, all of them fairly familiar but too often overlooked in discussing education. One of them is “approval.” The professional man is more “respected” than the manual worker. But that scarcely exhausts the matter. Respected by whom? Contemporary sociologists speak of the approval of one’s “reference group”—those to whom one looks for guides to action, for the definition of the possible, for ultimate approbation. But what leads *this* individual to look to *that* particular reference group?

What appears to be operative is a process we cavalierly call identification. The fact of identification is more easily described than explained. It refers to the strong human tendency to model one’s “self” and one’s aspirations upon some other person. When we feel we have succeeded in “being like” an identification figure, we derive pleasure from the achievement and, conversely, we suffer when we have “let him down.” Insofar as the identification figure is also “a certain kind of person”—belongs to some group or category—we extend our loyalties from an individual to a reference group. In effect, then, identification relates one not only to individuals, but to one’s society as well.

While this account is oversimplified, it serves to underline one important feature of identification as a process—its self-sustaining nature. For what it accomplishes is to pass over to the learner the control of punishment and reward. Insofar as we now carry our standards with us, we achieve a certain independence from the immediate rewards and punishments meted out by others.

It has been remarked by psychologists that identification figures are most often those who control the scarce psychological resources that we most desire—love, approval, sustenance. Let me skip this issue for a moment and return to it later.

The term identification is usually reserved for those strong attachments where there is a considerable amount of emotional investment. But there are “milder” forms of identification that are also important during the years of childhood and after. Perhaps we should call those who serve in these milder relationships “competence models.” They are the “on the job” heroes, the reliable ones with whom we can interact in some way. Indeed, they control a rare resource, some desired competence, but what is important is that the resource is attainable by interaction. The “on the job” model is nowhere better illustrated than in the manner in which the child learns language from a parent. The tryout-correction-revision process continues until the child comes to learn the rules whereby sentences are generated and transformed appropriately. Finally he develops a set of productive habits that enable him to be his own sentence maker and his own corrector. He “learns the rules of the language.” The parent is the model who, by interaction, teaches the skill of language.

In the process of teaching a skill the parent or teacher passes on much more. The teacher imparts attitudes toward a subject and, indeed, attitudes toward learning itself. What results may be quite inadvertent. Often, in our schools, for example, this first lesson is that learning has to do with remembering things when asked, with maintaining a certain undefined tidiness in what one does, with following a train of thought that comes from outside rather than from within and with honoring right answers. Observant anthropologists have suggested that the basic values of the early grades are a stylized version of the feminine role in the society, cautious rather than daring, governed by a ladylike politeness.

One recent study by Pauline Sears (in press) underlines the point. It suggests that girls in the early grades, who learn to control their fidgeting earlier and better than boys, are rewarded for excelling in their “feminine” values. The reward can be almost too successful, so that in later years it is difficult to move girls beyond the orderly virtues they learned in their first school encounters. The boys, more fidgety in the first grade, get no such reward and as a consequence may be freer in their approach to learning in later grades. Far more would have to be known about the other conditions present in the lives of these children to draw a firm conclusion from the findings, but it is nonetheless suggestive. There are surely many ways to expand the range of competence models available to children. One is the use of a challenging master teacher, particularly in the early grades. And there is film or closed-circuit television, opening up enormously the range of teachers to whom the student can be exposed. Filmed teaching has, to be sure, marked limits, for the student cannot interact with an image. But a kind of pseudo interaction can be attained by including in the television lesson a group of students who are being taught right on the screen, with whom the student can take common cause. Team teaching provides still another approach to the exemplifica-

tion of a range of competences, particularly if one of the teachers is charged specially with the role of gadfly. None of the above is yet a tried practice, but pedagogy, like economics and engineering, often must try techniques to find not only whether they work, but how they may be made to work.

I would like to suggest that what the teacher must be, to be an effective competence model, is a day-to-day working model with whom to interact. It is not so much that the teacher provides a model to *imitate*. Rather, it is that the teacher can become a part of the student's internal dialogue—somebody whose respect he wants, someone whose standards he wishes to make his own. It is like becoming a speaker of a language one shares with somebody. The language of that interaction becomes a part of oneself, and the standards of style and clarity that one adopts for that interaction become a part of one's own standards.

Finally, a word about one last intrinsic motive that bears closely upon the will to learn. Perhaps it should be called reciprocity. For it involves a deep human need to respond to others and to operate jointly with them toward an objective. One of the important insights of modern zoology is the importance of this intra-species reciprocity for the survival of individual members of the species. The psychologist Roger Barker (1963) has commented that the best way he has found to predict the behavior of the children whom he has been studying in great detail in the midst of their everyday activities is to know their situations. A child in a baseball game behaves baseball; in the drugstore the same child behaves drugstore. Situations have a demand value that appears to have very little to do with the motives that are operative. Surely it is not simply a "motive to conform"; this is too great an abstraction. The man who is regulating his pressure on the back of a car, along with three or four others, trying to "rock it out," is not so much conforming as "fitting his efforts into an enterprise." It is about as primitive an aspect of human behavior as we know.

Like the other activities we have been discussing, its exercise seems to be its sole reward. Probably it is the basis of human society, this response through reciprocity to other members of one's species. Where joint action is needed, where reciprocity is required for the group to attain an objective, then there seem to be processes that carry the individual along into learning, sweep him into a competence that is required in the setting of the group. We know precious little about this primitive motive to reciprocate, but what we do know is that it can furnish a driving force to learn as well. Human beings (and other species as well) fall into a pattern that is required by the goals and activities of the social group in which they find themselves. "Imitation" is not the word for it, since it is usually not plain in most cases what is to be imitated. A much more interesting way of looking at what is involved is provided by the phenomenon of a young child learning to use the pronouns "I" and "you" correctly. The parent says to the child, "You go to bed now." The child says, "No, you no go to bed." We are amused. "Not *me* but *you*," we say. In time, and after a surprisingly brief period of confusion, the child learns that "you" refers to himself when another uses it, and to another person when he uses it—and the reverse with "I." It is a prime example of reciprocal learning. It is by much the same process that children learn the beautifully complicated games they play (adult and child games alike), that they learn their role in the family and in school, and finally that they come to take their role in the greater society.

The corpus of learning, using the word now as synonymous with knowledge, is reciprocal. A culture in its very nature is a set of values, skills, and ways of life

that no one member of the society masters. Knowledge in this sense is like a rope, each strand of which extends no more than a few inches along its length, all being intertwined to give a solidity to the whole. The conduct of our educational system has been curiously blind to this interdependent nature of knowledge. We have "teachers" and "pupils," "experts" and "laymen." But the community of learning is somehow overlooked.

What can most certainly be encouraged—and what is now being developed in the better high schools—is something approximating the give and take of a seminar in which discussion is the vehicle of instruction. This is reciprocity. But it requires recognition of one critically important matter: you cannot have both reciprocity and the demand that everybody learn the same thing or be "completely" well rounded in the same way all the time. If reciprocally operative groups are to give support to learning by stimulating each person to join his efforts to a group, then we shall need tolerance for the specialized roles that develop—the critic, the innovator, the second helper, the cautionary. For it is from the cultivation of these interlocking roles that the participants get the sense of operating reciprocally in a group. Never mind that this pupil for this term in this seminar has a rather specialized task to perform. It will change. Meanwhile, if he can see how he contributes to the effectiveness of the group's operations on history or geometry or whatnot, he is likely to be the more activated. And surely one of the roles that will emerge is that of auxiliary teacher—let it, encourage it. It can only help in relieving the tedium of a classroom with one expert up here and the rest down there.

At the risk of being repetitious, let me restate the argument. It is this. The will to learn is an intrinsic motive, one that finds both its source and its reward in its own exercise. The will to learn becomes a "problem" only under specialized circumstances like those of a school, where a curriculum is set, students confined, and a path fixed. The problem exists not so much in learning itself, but in the fact that what the school imposes often fails to enlist the natural energies that sustain spontaneous learning—curiosity, a desire for competence, aspiration to emulate a model, and a deep-sensed commitment to the web of social reciprocity. Our concern has been with how these energies may be cultivated in support of school learning. If we know little firmly, at least we are not without reasonable hypotheses about how to proceed. The practice of education does, at least, produce interesting hypotheses. After all, the Great Age of Discovery was made possible by men whose hypotheses were formed before they had developed a decent technique for measuring longitude.

You will have noted by now a considerable de-emphasis of "extrinsic" rewards and punishments as factors in school learning. There has been in these pages a rather intentional neglect of the so-called Law of Effect, which holds that a reaction is more likely to be repeated if it has previously been followed by a "satisfying state of affairs." I am not unmindful of the notion of reinforcement. It is doubtful, only, that "satisfying states of affairs" are *reliably* to be found outside learning itself—in kind or harsh words from the teacher, in grades and gold stars, in the absurdly abstract assurance to the high school student that his lifetime earnings will be better by 80 percent if he graduates. External reinforcement may indeed get a particular act going and may even lead to its repetition, but it does not nourish, reliably, the long course of learning by which man slowly builds in his own way a serviceable model of what the world is and what it can be.

DISCIPLINE: THE LEARNING OF SELF-MANAGEMENT

Those who have spent much time in schools during recent years are impressed with the increased time and effort which has to be devoted to classroom management. In fact, Ausubel has stated that the lack of general attention to this matter in the literature almost suggests conspiracy. It can still be said that the biggest problem of the new teacher is discipline. There are many schools which run serenely along, but more and more those schools which are alert find the need to reexamine their methods of control and the means of teaching pupils reasonable self-management. There is also the matter of adolescents wanting—and sometimes demanding—more say in decisions which affect them, both as to rules of conduct and curriculum as well as to the respect accorded them by adults. Reluctant adults tend to withhold power until the force cannot be held back. This tends to polarize adult and youth forces as oppositional rather than encouraging a mutual participant democracy. When this happens, the idealistic youth are often influenced by the neurotic power-seeking few and rational decisions are hard to arrive at. There is an intoxication which takes over, a kind of contagion, which follows upon adult capitulation under force. In effect it teaches youth that might is the source of right, which is far from the school's goal.¹

All of this is further complicated by the fact that controls are less evident in society at large. Aggressive behavior and delinquent acts are on the rise on both sides of the Iron Curtain. Perhaps the most evident result is that the schools have been delegated a larger and larger portion of the responsibility as the one agency of the culture which is public, responsible, and in contact with all children for a huge block of time.

But schools cannot teach self-management in some mystic way. The only procedures available are those exercised by teachers and specialists as they interact with pupils. And almost everything which happens has some effect on

¹See "American Adolescents Today—A New Species," by E. B. Hurlock (*Adolescence*, 1966, 1, 7–21), for a discussion of the forces at work in adolescent culture today.

children's behavior—even the climate. Children have been found to be more restless and “squirmy” on days with high humidity and low barometric pressure! (Brown, 1964)

WHAT DO WE MEAN BY DISCIPLINE?

When people differ regarding the meaning of a term, discussion is hampered. One principal sees the problem of discipline as “creating strong character by mastering disagreeable tasks.” A teacher may feel discipline has been achieved when a class is quiet and orderly. Another will see discipline as self-directed control of behavior. Children frequently consider discipline to be what adults do to them when they have been “bad”—some type of punishment.

So, not surprisingly, whether or not a teacher has “discipline problems” depends to a great extent upon his definition of good discipline and, therefore, upon his values.² Our standards of conduct determine the types of behavior we consider praiseworthy or objectionable. These standards are the products of our formative experiences and of pressures from the groups around us. What some persons term misbehavior others might call natural exuberance. The definition of problem behavior depends largely on who judges the action. Only a few kinds of misconduct actually interfere with the well-being of society. Much misconduct is merely an offense against rules.

When a teacher remarks sadly that he is “getting a poor group next year,” he may mean that the group offers an unwelcome challenge, that the students will have to change their ways, or that he hopes he can put up with them. If the judgment is that the group will be a “good” one, the teacher seldom means that all the students are mature or well adjusted. His comment implies that the group has learned to work together, or has learned to be quiet, or has learned whatever he considers important.

Probably all would agree that democracy relies upon the ordinary citizen's ability to use inner controls and his willingness to accept responsibility for his behavior. The schools are relied upon to encourage the growth of the student's ability to manage himself in a socially acceptable and inwardly satisfying manner. Behavior that meets society's needs and at the same time is satisfying to the individual is behavior which contributes to his mental health. The sobering fact seems to be that the school more often serves to crystallize the character formation already begun in the child than to shape it in desired directions (Peck and Havighurst, 1960).³

The concept of fostering intelligent self-direction implies that students be permitted as much freedom as they can handle wisely. Such freedom is not to be confused with “letting the students do as they please.” The emphasis is upon freedom *for* planning and participation, not freedom *from* any direction or limitations. The need for social controls is obvious. No society or classroom could exist

²For a lucid discussion of this matter as well as others discussed in this chapter and examples of a model applied to classrooms at various age levels, see *The Psychology of Discipline in the Classroom*, by W. J. Gnagey (New York: Macmillan, 1968).

³An excellent discussion of the nature and nurture of mental health is presented by A. Arkoff in *Adjustment and Mental Health* (New York: McGraw-Hill, 1968).

for long in a state of anarchy. The processes of setting effective social controls will be discussed later in this chapter.

To become capable of responsible self-direction, the individual must grow from the dependence of childhood to the independence of adulthood. As a teacher encourages classroom practice in self-management and gradually and appropriately withdraws adult control, he contributes to the maturity of his students. Discipline in this sense is an integral part of the learning process, an aspect of the goal of developing the whole student. It is not a condition of the moment but a process of learning.

Misbehavior represents a lack of rapport between expected and actual behavior. All children misbehave at times, but occasional misconduct is not necessarily regarded as problem behavior. The preschool child who claims to have seen "an awfully big giant" is not deliberately telling a falsehood. He simply has not learned to distinguish between truth and untruth, and such fabrications are normal for his age.

Each stage of development carries with it some behavior patterns which may irritate and annoy adults and are thereby interpreted as problem behavior. And they may indeed create a problem for the adult. Yet such behavior is evidence that the child is maturing. Growth-typical responses are outgrown and dropped when the child successfully moves beyond the stage with which they are associated.

The excited first-grader reaches into the aquarium to "pet" the fish, but when he is older, he can "just look." Many six-year-olds are poor losers. They are likely to quit the game or cheat a bit when they are losing. But such behavior can be shed a year or so later when they are a little more sure of themselves. An early adolescent boy may be loud and boisterous to impress the girls, who giggle in return; as they grow more comfortable in their adolescence, they give up such behavior without being lectured about it. Parents and teachers will avoid much adult-child misunderstanding and conflict if they understand development well enough to distinguish between growth-typical behavior and actual problem behavior.

When does misbehavior become problem behavior? Gum chewing may annoy one teacher and yet not another teacher, the child's parents, a psychologist, or the principal. This lack of consistency among those in authority means that pupils must become researchers, testing each environment to see what will be tolerated. A misdemeanor that is severely punished in one's first hour class may be merely frowned upon in the second and completely ignored in the third.

Barnes (1963), in a study of elementary teachers, found little effort being made to relate behavior problems to basic needs of children. In many cases, these teachers took no action at all; they seldom inaugurated more than one remedial activity. Where remedial techniques were employed these tended to be positive rather than negative. The investigator estimated, however, that only about 25 per cent of the actions taken were appropriate to the situation; the teachers were best at helping timid children and those with low IQ's.

Youngsters naturally see things from their own point of view and exhibit values and interpretation at variance with adult standards.⁴ But no child grows up

⁴For discussions of children's perceptions of misbehavior, see "Milieu Influence in Children's Concept of Misconduct" by Paul V. Gump and Jacob S. Kounin (*Child Development*, 1961, 32, 711-720) and "Sixth Grade Children Evaluate Twelve Cases of Malicious Mischief" by A. E. Robinson (*Journal of Educational Research*, 1963, 56, 554-555).

without at some time or another transgressing his own code of conduct as well as the adult code. Usually these transgressions are accompanied by guilt, unless the circumstances—such as a “mean” or completely ineffective teacher—seem to justify them. In fact, compositions on the “worst thing I ever did” can be unnerving to a teacher if pupils are candid. Kooi and Schutz (1965) performed an interesting analysis of junior-high students’ disturbing behavior. They observed twelve 55-minute samples of each youngster’s behavior. In a final factor analysis of the disturbances noted, the following factors were identified: physical aggression, peer affinity, attention seeking, authority challenge, critical dissension. The authors suggest that different needs are being met by these five kinds of misbehavior, implying that teachers will need to cope with them in different ways.⁵

At the high-school level lack of student preparation is a frequent complaint. “Cutting up,” making noise, and talking also give rise to action by the teacher. Defiance of the teacher’s leadership is another cause of concern. Truancy is a recognized problem. And if we add to the list of physical truants the psychological truants who sit in school but are absent as far as class activities are concerned, we have a substantial group.

Thus a large percentage of problem behavior confronting teachers consists of aggressive, antisocial action ranging from playground mischief to well-organized delinquencies. But this is not the whole picture.

All teachers will have in their classrooms children who are models of conformity yet whose behavior should be considered a problem. These are the unhappy children who have not organized themselves for productive work, the ones who feel grossly inadequate and unimportant, the quiet and withdrawn children, and the shy or fearful ones who often file quietly in and out of school and receive no more than passing consideration. Yet these children are discipline problems as much as the aggressive, noisy youngsters, for they too have not yet learned the mature self-direction that will make their behavior both satisfying to themselves and acceptable to others.

In a comparison of conforming and nonconforming high-school boys, it was found that the nonconformers showed poorer social adjustment, were more impulsive, came from lower socioeconomic homes (Powell and Bergen, 1962). The conformers liked school better, had higher vocational ambitions and longer educational plans. Also, nonconformers more often had part-time jobs, owned cars, “hung around,” and smoked. Thus a life pattern rather than just a school response is involved. Some investigators feel that low peer acceptance is a provoker of disruptive behavior since the school setting is essentially a social one. Attention is better than being ignored, as a temporary ego appeasement (Lorber, 1966).

While every discipline problem is, in the last analysis, unique, it is nonetheless helpful to classify the major sources of trouble. These include teacher behavior, learning activities, group interaction, and individual behavior problems. Of course these factors do not always function singly. The remainder of this chapter will be devoted to examining the first three types of problems and to methods of overcoming them. Teachers frequently look for a blanket remedy for problem situations.

⁵Other studies of discipline problems include “High School Discipline: Teachers’ Report on Disciplinary Problems in Seven Phoenix High Schools” by Herbert Zeitlin (*California Journal of Education Research*, 1962, 13, 116–125) and “Alleged ‘Misbehaviors’ Among Senior High School Students” by James E. Greene, Sr. (*Journal of Social Psychology*, 1962, 58, 371–382).

But we still have no "miracle drug" which can be administered in all situations. The device that brings a cure in one case may do nothing at all when applied to another case or may even make the condition more serious.

PROBLEMS STEMMING FROM TEACHER BEHAVIOR

The teacher cannot be an effective agent in the learning process without the active cooperation and participation of his students. If he establishes rapport and a sound working relationship with them, many kinds of learning can be effected under his guidance. But if he lacks the ability to work with and guide students, he will be at cross-purposes with them—pulling in one direction while the students pull in another.⁶ Modern feedback techniques such as microteaching or television films which give a visual and auditory record provide opportunities for the teacher to see himself in action and evaluate his own performance.

Although nobody likes to admit to inadequacies in human relations, there are occasions when teacher personalities clash with student personalities—when teachers cannot establish rapport with their students because of personality quirks or because of the way they fulfill their leadership role.

Sources of trouble

Some of the common leadership methods that lead directly to strain can be listed for purposes of analysis. This list is intended to provide clues rather than solutions.⁷

Rigid leadership Rigidity in any form creates problems. Compulsion to cover ground and insistence on high achievement take their toll of student tolerance. Requirements appropriate for some students may be too rigid or too unstructured for others. Sometimes teachers are so saturated with one particular point of view that they see all of life from their own perspective. The English teacher may feel that the student who is not bound for college merits little attention. Attempts to make all members of the class do exactly the same caliber of work and plan for college will result in unhappy students and an unhappy teacher.

Strict repression of physical activity, especially at the elementary and junior-high levels, can produce tension. Restriction of movement, constant reminders to "stay in your seats," removal of recess privileges as a means of punishment, all can lead to increased tension and irritability among the pupils.

⁶Many studies have shown that teacher behavior produces direct counterpart behavior in children, especially younger children. See "The Comparative Influence of Punitive and Non-punitive Teachers Upon Children's Concepts of School Misconduct" by J. S. Kounin and P. V. Gump, and "Some Relationships between Pupil Behavior and Certain Teacher Characteristics" by D. G. Ryans, both in *Journal of Educational Psychology*, Vol. 52 (1961).

The first authors who present a real synthesis of the important school factors for the teacher are E. L. Phillips, D. N. Wiener, and N. G. Haring in *Discipline, Achievement and Mental Health* (Englewood Cliffs, N.J.: Prentice-Hall, 1960). Their volume is recommended for further study. A valuable article summarizing the research on several classroom factors in discipline is "Explorations in Classroom Management" by J. S. Kounin and others *Journal of Teacher Education*, 1961, 12, 235-246).

Teacher insistence that each pupil work quickly and at the same rate as the rest of the class produces tensions which may manifest themselves in all sorts of undesirable actions. Constant emphasis upon the shortness of time creates needless pressure upon students. Regulation of interest by the clock is foreign to youngsters.

Too little adult leadership Too little leadership can throw students into confusion and bring out unacceptable behavior. Basic insecurity in the teacher can produce many difficulties in pupils. Children sense the basic motivations of adults far more accurately than most adults realize. And they react more to what adults do than to what they say. The teacher who is anxious, who is defensive, who is afraid, is usually recognized as such by his pupils. Children are especially sensitive to teacher insecurity because they are themselves less secure than the average adult, and usually they have not yet learned successful defenses for coping with ineffective adults. Pupils will often sense a teacher's weakness, play upon it, and then turn in dismay as the weakness becomes apparent. It is as if they test the teacher in order to trust him and are upset when they find him wanting. There is no substitute for adult maturity.

Insecure teachers frequently resort to a very limited number of techniques in their attempts to handle youngsters. Typical one-track philosophies include both "love is enough" and its antithesis, "punishment is the only answer." These singular methods are used and reused without any appreciation of their ineffectiveness. Teachers with such conceptual limitations are unable to cope with situations that differ from the ordinary. They need a psychological mind-stretcher.

If a teacher is "nice but weak," there is an ambiguous feeling on the part of many students. When they take advantage of such a teacher, they later feel guilty. They may then try to conform to his wishes or cover up their guilt with more negative behavior.

In contrast, a mature teacher will be able to establish true democratic relationships with pupils. Where there is clear, firm order, neither teacher nor student need be pushed around by the other. In such a setting, as we saw in Chapter 9, everyone can be free of threat and free to be constructive.

Vacillating leadership Students are confused by teacher vacillation. In the schoolroom, as in the home, there must be a visible set of limits which are plausible, generally consistent, and understood by all. If the teacher is capricious from day to day, pupil to pupil, and situation to situation, true limits are never defined or understood. If regulations are vaguely defined and inconsistently enforced, the pupil is continually groping for clues as to what is expected of him.

There may be significant differences from class to class which confuse pupils. Any realistic person expects differing behavior from different teachers, but where there is an overall school policy, such differences will be minor ones.

We cannot prescribe a specific amount or kind of control for all groups. One group may require firmer control than another. "Appropriate" methods are appropriate only in reference to a particular group. As we saw in Chapter 9, individual personality needs of members and their past experience and expectations all help to determine what kind of leadership and social organization they will find most comfortable. You always will need to analyze the particular group,

determine its needs, and then decide what methods of leadership it requires — being willing to recognize instances in which your own faulty leadership may be inducing the problem behavior you see. Most teachers have to learn the skills of group leadership gradually.

Personality quirks Teachers may be using leadership methods sufficiently suitable to their classes and still find themselves faced with discipline problems of their own making because the students see in them certain traits they cannot accept. The personality of the teacher always enters into and influences the effectiveness of the total learning situation. The teacher teaches not only by what he says but by what he does, by the kind of person he is.

There is a wide range of personality quirks that can hinder teachers from establishing rapport with their students. For example, a teacher can be too curious—a psychological Peeping Tom. Such teachers seem to get vicarious pleasure from prying into the private lives of others and are especially fascinated if intimate topics such as sex or family squabbles enter the conversation. If such subjects are not brought forward by the student, the teacher may probe or suggest until he finds an answer to suit his curiosity.

At the other extreme are teachers who are too impersonal, whose social communication is stilted and restricted. They have never felt ready to express themselves about personal matters and cannot stand to listen to the youngster who does. They back away and block his expression lest they learn something which, as they say, is none of their business or which might make a demand upon their emotions and their time. They try to orient everything toward school lessons, assignments, and class behavior. Such teachers do not concern themselves with human relationships; for them, the province of the school does not go beyond class lessons. Thus the needs of the pupil are sacrificed to the inadequacies of the teacher.

A teacher may be too dictatorial. In every school there seems to be the teacher who wants to “play God.” As a teacher-counselor he is ready to dictate any youngster’s life, make profound decisions as he sees fit, and pronounce ultimatums from his high pedestal as possessor of knowledge and seer into the future. One student said of such a teacher, “We are supposed to laugh at his jokes, but he gets mad if we say anything funny.” This teacher does not like to be crossed. He has the answers and expects the student to follow his judgments. The student learns to say “yes” even if he does not understand or agree. He receives little help from such a teacher since the teacher’s attitude precludes any decisions or expressions of feeling on the part of the student. Such behavior is particularly inappropriate with adolescents.

A teacher may be too concerned with right and wrong. There are teachers who seem to feel that their fundamental role is that of moralist. They think of themselves as the community conscience and feel it their duty to preach their values to their students. They compulsively point out right and wrong and pass moral judgments upon all situations. Expressions like “should,” “the right thing,” “I’m ashamed,” and “What will people think?” are sprinkled through their talks with students.

A nagging, moralizing atmosphere brings out negative responses in students. It pricks their consciences without giving them any way to change or any help in

learning better behavior. Too frequently, the ideals upheld and the attitudes expressed by teachers are compatible with students' theoretical values, but incompatible with the practical lives they lead.

Sometimes there is a real conflict between the values held by the teacher and those held by the students. But it does not necessarily follow that either is "wrong" or in need of reform. Yet neither does it mean that rapport and helpful influence are impossible. A teacher need neither give up his own values nor insist that his class accept them. We can see youngsters as likable individuals worthy of respect, at the same time making no secret of the things that have meaning and value for us. Much harm is done when teachers try to mold everyone into the same pattern.

These are some of the traits that can rub students the wrong way and hinder teachers from establishing wholesome and helpful personal contacts. What can a teacher do about correcting such shortcomings?

Overcoming the problems

Inadequate relationships on the part of the teacher are usually the result of defensive reactions to cover up personal insecurity. Reasons for the insecurity may be simple and relatively obvious, or they may be complex and deep. There is no easy way to erase insecurity, but it may be possible to alleviate it or bring it under conscious control. A teacher who is ready to take a frank look at what he is doing and what he is feeling will find the following procedures helpful.

Discussion with other teachers Frank discussion with other teachers can be enlightening. Sometimes discussion means nothing more than common commiseration. Approached with purpose, however, it can be a way to learn how others have handled certain pupils they did not like or certain conditions that irritated them. As a starter, it sometimes helps to write out descriptions of pupils whom one likes and whom one dislikes to see if the personality clashes follow any pattern. When a teacher gives thought to *why* a pupil makes him feel one way or another, he may see possible self-corrective measures.

Discussion with supervisors Open discussion with supervisory personnel or special consultants can be helpful. Fear of authority sometimes makes it hard for a teacher to go to the person in charge and ask for help. Nor do all authorities want to hear of trouble. But a principal willing and able to think through behavior problems is an asset not to be overlooked.

When the school has a psychologist or school social worker, he may be the one to lend insight since he is trained in recognizing personality dynamics. Open discussion about feelings and attitudes should not be confused with therapy. Most of us, being within the normal range of adjustment, have many potentials for change that do not require an intensive therapeutic relationship.

Evaluation by pupils Teachers can discover a great deal from pupil evaluations. In fact, all teachers should periodically seek pupil evaluation of their work, including judgments about the curriculum, group relationships, and individual pupil behavior, as well as pupil-teacher relationships.

It is not always easy for a teacher to ask his students to tell how they feel about the way he relates to them. One class may be made afraid and anxious by such a request; another may unleash such a flood of invective that the teacher can hardly face the group the next day. Yet information can be obtained without damaging results when questions are carefully constructed about such specifics as the degree of control the teacher employs, the ease the pupil feels in bringing his problems to the teacher, and how accepting of pupils the teacher seems to be.

The authors' experience indicates that each inquiry must be designed for the particular situation. Even then, it is a procedure requiring caution. If a school psychologist is available, he should be consulted in advance for help in framing the questions. Then, when the results are in, his help should be sought in interpreting them.

Self-study New teachers and dedicated career teachers as well sometimes find themselves under pressures requiring self-study more intensive than the preceding measures, yet short of therapy. Self-understanding can be enhanced by readings, courses, and seminars.⁸ Jersild (1955) has many suggestions to offer teachers who wish, singly or in groups, to move ahead in professional awareness. He has devised questionnaires that a teacher can answer and then compare with norms to reveal sensitive areas of behavior. Jersild recommends that such self-study be undertaken under the guidance of a competent psychologist.

Many teachers have found "T" or "S" (training or sensitivity) groups useful in complementing the awareness gained from self-study. Open discussion of the way one behaves in the group, the feelings generated, and the attitudes expressed can enable a person to alter his behavior. But persons with serious problems should not undertake sensitivity training without the guidance of a trained group leader.⁹

Personal therapy When the cause of a teacher's problem-creating behavior lies in personal problems below the conscious ego level, he needs therapy. There are teachers who, for reasons of which they are not aware, have grown up unable to accept children and youth adequately. And even teachers who are in general mentally healthy can at times experience strain which affects their behavior at school. Such stress may be brought on by difficulty in adjusting to life-cycle problems such as those related to marriage, divorce, one's own children, menopause, or death of loved ones. Sometimes these events take a long time to be absorbed into a normal life pattern and stir feelings that spill over into school life. Thus it is possible for outside conditions to produce general strain or even exaggerated reactions to a particular pupil or type of pupil behavior. One of the authors, in a teachers' seminar, found that in a single week this small group of teachers had faced stress-producing life problems ranging from a death in the family and serious illness to difficult financial and personal problems.

Clinical work with teachers suggests that personal strain is a source of difficulty too often ignored. A persistent pain in the stomach sends us to the

⁸Numerous sources are available to help you toward self-understanding. Among these is Ray H. Simpson's article "Self-Evaluation and Personality" in *Children, Psychology, and the Schools*, by Bryant Feather and Walter Olson (Glenview, Ill.: Scott, Foresman, 1969).

⁹A special section of articles dealing with "The Group Phenomenon" appears in the December 1967 issue of *Psychology Today*.

doctor. A persistent psychological pain should send us to the psychiatrist, psychologist, or psychiatric social worker. Yet often we hesitate to seek such help or try to deny to ourselves that we really need it. If we knew how many teachers have found such assistance helpful, we would be less reluctant to seek individual or group therapy.

You will recognize that everyone has attitudes which in some degree resemble many of those mentioned in the foregoing pages. Your responsibility as a teacher is to understand your needs well enough to avoid sacrificing your pupils to them. Everyone has limitations in interpersonal relationships; it is not a weakness to recognize them. It is a weakness, however, for a teacher to take advantage of his students through an unwillingness to admit his own needs and focus them in proper perspective.

PROBLEMS STEMMING FROM LEARNING ACTIVITIES

Sometimes either the material or the way it is presented causes discipline problems. Science, or even baseball, can be presented in such a way as to make accomplishment unrewarding and achievement of the teacher's demands impossible. You may have had gym classes where games were organized in a dull, stereotyped way so that even an activity intrinsically interesting to most pupils became a boring waste of time.

Sources of trouble

Any facet of the curriculum may encourage problem behavior. The program may be obsolete and only remotely related to the basic needs and abilities of the children. The physical or psychological environment of the classroom may contribute to the discipline problems a teacher faces. Flanders (1959), in a study of one hundred social studies classrooms, found that teachers spent less than 5 per cent of their talking time taking notice of pupil-initiated ideas.

Expectations too low When teachers underrate students' abilities and interest levels, the absence of challenge in classroom activities is likely to produce frustration. "We did this way back in the third grade" or "Who wants to do this baby stuff?" are clues that children are resenting a program that does not provide enough stimulation. Teachers whose plans are so nebulous that busy work becomes standard procedure can expect restlessness and lack of interest which set the stage for more active problem behavior.

Expectations too high Subject matter is especially likely to create stumbling blocks when teacher expectations are too high. Perhaps the curriculum will produce difficulty for a whole class, perhaps for only one or two members.

The teacher who imposes college standards on high-school students is being unrealistic. The competitive attitude promoted by constant testing and publicizing of achievement is hard on those who are constantly struggling to be on top as well

as those who know they will never get there. Such pressures leave little room for interest or involvement.

What happens when the classroom activities provide not a challenge but a block? First of all, such a situation produces frustration, a condition of emotional disequilibrium. Some learning may take place, but in a state of emotional discord the direction it will take cannot be predicted. If a student continually fails to achieve what is demanded at school, at home, or in the gang, the damage to his feeling of self-adequacy is unlimited. Individuals will resort to all kinds of devices in order to avoid the sense of failure. As we have seen, one of the most common devices is the refusal to try. You can't fail at something you don't try.

Let us examine some typical reactions to frustration. Remember that the cause of the frustration can be many things in addition to the material being studied. It may be the teacher, the group, or something quite apart from school. For the time being, however, we are thinking in terms of blocks induced by the curriculum.

When a pupil is frustrated by an inappropriate curriculum or inadequate handling of the curriculum by the teacher, he may turn to any of the following or to a combination of them:

1. Aggressive behavior in an effort to do the task; hard work; overevaluation of grades; worry about success; compulsiveness about assignments.
2. Aggressive behavior against the object of frustration—the subject, the teacher, the school; insubordination; hostility; perhaps actual destructiveness.
3. Aggressive behavior against successful classmates; bullying; fighting; belittling “bookworms”; becoming classroom pest.
4. Withdrawal behavior seen in slowness, negativism, apathy; passive, bored attitude; lack of interest; “I don't want to do it.”
5. Avoidance behavior; aversion to participation in class activities; psychological and physical truancy; daydreaming.
6. Self-depreciation; “I'm no good. I can't do it. I'm dumb”; feelings of inadequacy, worthlessness; “Why try? I can't win anyway.”

Overcoming the problem

What can the teacher do to counteract curriculum-produced discipline situations? The answer is easy to state: fit the learning demands to the class potential. But this is easier said than done. The following are a few channels to explore.

Matching demands to pupils The first direction a teacher should pursue in trouble-shooting is to check curriculum demands against the actual capacity of the pupils and not against a hoped-for level implied by age or grade level. What about the ability and skill level, not of the average fourteen-year-old, but of *these* fourteen-year-olds? Many times requisite antecedent skills for a given course simply are not present. On the other hand, a class may have outdistanced the prescribed program and be ready for more challenging material. To disregard pupils' readiness in planning activities and choosing materials is to invite frustration for all concerned.

Having gathered information on class potential, the teacher has several resources open to him for checking the appropriateness of academic materials.

Some schools provide curriculum consultants or other special personnel who can help. Others utilize curriculum study committees for this purpose. Lacking either consultants or committees, a teacher can extend his perspective by taking a course of study in curriculum or by reading publications on what should be offered in given situations and what learning can be expected. Should a teacher feel it necessary to present material which deviates significantly from the usual curriculum, he would be wise to consult first with the administration. Wherever possible, the parents' understanding and cooperation should be sought.

Pupil achievement in and of itself has been found by many researchers to be a significant element in screening for problems. How well a youngster does schoolwork is a critical aspect of his life. Stringer (1959) advocates an academic progress chart for each student on which his year-by-year achievement is plotted. Here any significant changes or deviation in performance will be apparent at once. Such information is seen as valuable not only in direct work with the student and parents but as an index of mental health. When a pupil does not learn as aptitude tests suggest he might, the teacher can well anticipate other kinds of difficulties.

Checking on one's expectations A teacher can also analyze whether or not his own level of expectation is realistic. A teacher's level of expectation is implied by his grading. Perhaps the grades for the class as a whole are low. Frequently a new teacher, or an experienced teacher in a new position, finds it necessary to study his own standards in relation to the standards of the school as a whole. There are teachers who seem to feel that the whole cold war must be won in their seventh-grade science class. Sometimes these teachers feel they must compensate for other teachers who, in their opinion, are too easy on the pupils. Naturally there will be some variation in expectation from class to class, but wide variation from the general level of expectancy is confusing for students and may indicate unrealistic standards on the part of the teacher.

Checking on the physical setting Sometimes discipline problems are caused by physical discomfort. Poor lighting, crowded conditions, uncomfortable furniture, or too many restrictions on moving about all may contribute to restlessness and minor annoyances.

Even with equipment that is far from ideal, the teacher may find many ways of improving the physical environment. He can compensate for lack of optimum facilities by allowing periodic opportunities for children to move about and work off their superabundant energies. The younger the children, the greater their need for frequent physical activity and the shorter the length of time they can sit and work at one task. If desks are close together, the teacher can separate students who are antagonistic toward each other or who have such a good time with each other that they forget to do their work.

Confusion and noise among a large number of children tend to discourage less boisterous children from taking part in group activities. The more aggressive children seem to hold sway in such a group. A nursery-school teacher of our acquaintance found that her hyperactive children were pushing the quieter youngsters further and further into isolation. She could not seem to control the active children, who were beginning to resent her attempts to restrict them.

Finally, she arranged some storage cases to divide her room into noisy and quiet areas. She found that she no longer needed to quiet the normally vigorous extroverts, while at the same time the less active children began to find themselves.

In another case, a high-school chemistry class was fast becoming a joke. "Horsing around," running in and out to the rest rooms, and lengthy giggling sessions were the order of the day. Although chemical apparatus was very limited, the teacher was trying to keep all the members of the class together in their work. Consequently most of the class spent part of each period waiting for equipment and materials. Some students resorted to copying the results of others' work. Many wasted the period playing.

To solve this discipline situation, the teacher had to reorganize the material and sacrifice some of his compulsion for having everyone do exactly the same thing at the same time. He found that with four different units going concurrently, each group used different equipment and the assignments were no longer impossible to complete. His new design took considerable time and thoughtful planning, but teaching began to be rewarding again and learning held new appeal for the students.

Research shows that periods during which pupils reorganize their activities or move from one project to another are the highest in problem behavior. Teachers need skill in helping children change from activity to activity as well as in timing the school program effectively.

Providing a challenge for students Students engaged in worth-while activities they find challenging are more likely to be developing the know-how of effective self-management and are less likely to become discipline problems. When children spend their time doing busy work, trouble is bound to break out. Yet the same youngsters can become so engrossed in building a hut on the neighborhood empty lot that they forget to go home for meals. This is not to suggest that children ought to do every day, all day long, only what appeals to them, but rather that the teacher can redirect existing motivations into essentially worth-while activities, thereby creating a situation in which children feel they are doing something that makes sense.

Even an exciting activity becomes tiresome after a length of time. Routine can be deadly, particularly for growing youngsters. Variations in pace and procedure serve to stimulate new interest. A skillful teacher, like a skillful playwright, changes scenes to develop the theme.

Helping the special child Sometimes trouble stems from the fact that a particular youngster is too different from the others—in ability, emotional control, or some other characteristic—to fit into the pattern that is appropriate for the others. The "discipline problem" may evaporate when suitable provisions are made for such a child. Chapter 12 is devoted to a discussion of such problems.

PROBLEMS PRODUCED BY GROUP PROCESSES

In a great many instances students behave acceptably as individuals but somehow have not learned to cooperate and work together in a group. They may lack

experience with group activity or have a hazy conception of the requirements for good group membership. Perhaps they are reacting to personality conflicts within the group. The trouble we are discussing here does not lie in individual case histories but in the psychological structure of the class as a group.

Sources of trouble

Again there are several factors that may be contributing singly or in combination to class problems.

Lack of readiness for democratic procedures As we have seen, a group which has known only submission to authority cannot be expected to handle freedom without considerable guidance and outside direction. Sheviakov and Redl (1956) tell of Miss Jones, a teacher who took over a group of eighth-graders known for their bad reputation and predelinquent behavior. Miss Jones, in her eagerness to apply her knowledge of "democratic procedures," established a system of self-government in the class. It was soon obvious that these youngsters simply did not have the background for a democratic classroom. Several bullies ran the show, rules were made and broken, and everyone got into everyone else's hair. The authors comment:

The mistake made is obvious. Miss Jones' idea was right insofar as an experiment in self-government is the best way for youngsters to learn basic attitudes toward each other and their community. However, we also know that such an experiment if made with a group that is not ready for it will not affect momentary behavior for quite a while.

Pent-up frustration A whole class can become involved in a riot when tensions mount to the point where the slightest spark can set them off. None of the students need be the rabble-rouser type, nor would any have started a feud without the backing and active participation of most of the class. For example, a junior-high class switched from the "old" to the new math at midterm. Students who had been doing well now found themselves at a loss; the teacher covered up a lack of knowledge by overdemanding and underexplaining. As a consequence, the class became more and more frustrated until one of the "good" pupils openly refused to work and others followed suit. Fortunately, the teacher sensed what the trouble was and adopted a new, slower approach.

Contagion In Chapter 9 we discussed the concept of "contagion" in groups. Groups can become hilarious, giggly, mimicky, and function on an inefficient level. Almost everybody gets into the fracas, and criticism of their behavior only causes them to become more uncontrollable. Dissatisfaction with inadequate class activities can spread to defiance of authority and mushroom into widespread pupil antagonism. In his studies of group behavior, Redl (1966) has found there are many variables involved in contagion, including type of behavior, group solidarity, degree of frustration, group configuration, and leadership methodology. Basically, Redl finds that when the emotional tone is appropriate, behavior responses spread rapidly from pupil to pupil. When this occurs, the group as a whole enters in, and



Mischief can spread like wildfire among a group of youngsters when the teacher turns her attention away from the classroom as a whole for a few moments. First one pair of eyes, then another, is drawn to the source of the excitement. Such incidents do not always require strong disciplinary measures, but the wise teacher knows how to keep at least half an eye out for trouble—and knows whom to keep it on.

individual members find protection within the group, thus reducing individual guilt.

It is presumed that contagion is induced most effectively when the initiator has high status in the group, when he has chosen an appropriate time, and when the behavior he incites is in keeping with the impulse needs of the group. Very small children sometimes respond to a shrill member by joining in the screaming and hilarity *en masse*. Preadolescents may follow a chief taunter by joining in the scapegoating of a hapless member of the class. Adolescents may follow a leader's cues responding pro or con to a new teacher.

The anxiety produced by group misbehavior can induce even more misbehavior. A mild act of misbehavior, protected because everybody does it, produces some individual guilt accompanied by anxiety. The pupil may find it easiest to cover up the tension resulting from the anxiety by acting up even more, the wilder behavior obliterating previous concern. This behavior increases the guilt and anxiety and the attempt to remove them produces more acting up. This cyclic development in a group may go on until the members become hysterical, unless one of them gives the relief cue, answers his anxiety by saying "enough," and reverses the trend.

On the other hand, there are times when the group does not follow someone who tries to start a chain of behavior. If the individual does something far beyond the expected range of behavior, then the group may be shocked, reject the actor and his behavior, and retreat from such frightening action. If a class member were

to strike the teacher, for example, it is likely that the others in the group would recoil and become anxious. Redl refers to such a response as a "shock effect."¹⁰

Composition of the group The composition of the group is sometimes a cause of difficulty. Wide diversities in age, general development, ability, and background will increase the teacher's problem in helping the group learn to work and live together. The way in which the teacher organizes the class for any activity will influence the success of the group and subgroups in carrying out the program. There may be children who simply cannot work with certain others of the group. The teacher's skill in guiding them into committees and work groups with compatible youngsters may make a world of difference in the satisfactions they receive from schoolwork and the learning they accomplish. All children need to learn the self-control and the cooperation with others which will make them valuable to a group, but repeated mismatching that produces only strife and tension has little to recommend it.

Overcoming the problem

Limitations upon a teacher's time make it imperative that most of his energy be devoted to work with groups rather than with individuals. Even if the teacher had time to work with each child every day, there are many situations where the problem is a group problem and work with individuals would be less effective than work with the group. Discipline problems in which the infection is widespread, in which most of the class participates in behavior which they and the teacher recognize as misbehavior, cannot be contained by working with single individuals.

There are at least four procedures a teacher can employ to iron out discipline problems that stem from group processes. Two of these involve the active participation of the group itself.

Role analysis The teacher may find the key to the discipline difficulty by analyzing the roles he finds his students playing. One very high-pitched, tense group of fifth-graders failed to respond to any approach the teacher took. The teacher carefully examined the group from the standpoint of the roles played and found that tension for leadership roles (in this case whetted by parental pressure) made a large majority of the youngsters aspire to leadership. A class composed of children who all found security only in being "boss" created too much tension, and curious, wild episodes sprang from this tension. Through class discussions and meetings with parents over several months, both children and parents were helped to rethink their values. These discussions also gave attention to ways of sharing leadership and to ways of learning cooperation rather than domination.

Role playing We have discussed the technique of role playing, or *sociodrama*, in earlier chapters but it is relevant here as well. Many teachers have found it an

¹⁰Fritz Redl and his associates have done extensive work in child behavior problems with special application to the classroom. A reference that you may find particularly helpful is Redl's book *When We Deal with Children* (New York: Free Press, 1966).

effective technique for dealing with discipline problems that stem from group relationships. Here the group explores a problem through dramatizing it, discussing the factors causing it, and planning together ways of meeting it (Chesler and Fox, 1966).

Through "acting" the parts of other persons, the participants and the observers as well gain insight into the dynamics of human relations. They may see their own and others' actions and attitudes in a new light. For the teacher, it is an opportunity to gain insight into the feelings and problems of his students, for children often articulate their fears and frustrations when "pretending" to be someone else.

Two requirements must be observed if any benefits are to result from socio-drama. The problems acted out must be pertinent to real-life experiences and significant to a majority of the group. And the teacher must be willing to allow the pupils to explore the problem and interpret the roles as they see fit.

In one sixth-grade class where the children were busily working but were free to move around when they needed to, a fight suddenly flared up. Tom had passed Joan's desk several times, jolting the desk or bumping her arm each time. Finally Joan slapped him. Taken by surprise, Tom promptly slapped back.

After some class discussion of the disturbance two other children volunteered to reenact the scene. When the dramatization was finished, the rest of the class offered comments and decided upon some ways to avoid future similar difficulties. Finally two children replayed the scene to show how the fight could have been avoided or settled in a friendly way. Someone then suggested that Tom and Joan run through the scene. Both were smiling when they had finished (ASCD, 1949).

A classic example of this approach is a study by Rosenthal (1951) in which a fifth-grade class was conducted on cooperative democratic principles and given a series of special lessons based on psychodrama techniques. At the end of the experiment, members of the class showed improvement on three measures of adjustment: There was an increase in friendliness, more children were liked, and their average percentile rank on overall adjustment (as measured by the *California Test of Personality*) rose from 40 to 55 per cent with special improvement in Self Adjustment, Sense of Personal Freedom, Social Standards, Social Skills, and School or Occupational Relations.

In this case personal adjustment, social relationships, and learning improved together. On the other hand, the most seriously disturbed children did not improve under this program. For such children perhaps the most a teacher can do will be to avoid adding more negative pressures.

Similar insights can be obtained in a less artificial way with groups of adolescents. The teacher can ask members of the group how they would deal with given problem behavior if they were the teacher. This generates some identification with the adult role requirements.

Breaking up the group Many times disruptive contagion will not be so likely to spread through a whole group if the unit is divided. Subgroups provide barriers to overall communication and the disturbances may thus be isolated. Action requiring a large audience is not so appealing in such a situation. The boy who clowns in front of thirty may find his behavior unrewarding in a group of four.

Group discussion When group morale and behavior are not as good as could reasonably be expected, the teacher can turn to group discussion. Experts hold widely divergent views regarding the value of group discussion for group control. There are those who believe that the members of the classroom group should have supreme control. To this end many plans for "group courts" and student-controlled governments within the classroom are made. The class sets up its own laws and agrees on appropriate punishments for violations.

Such activity may have merits, but too often it burdens the class members with decisions requiring insight and objectivity about human nature which they are not yet prepared to handle. Punishments are often crude and ruthless, not at all designed toward producing positive growth in the "culprit."

In a more subtle way the teacher creates the same negative result when he says, "No one leaves the room until we find out who took the money" or "No one goes home until everyone cleans his desk. It's up to all of you to take care of this matter." Two contrary currents are set up by such an adult dictum. On the one hand, group solidarity is strengthened. On the other, group frustration is aroused because one or a few "make it bad for everybody." The group is inclined to turn on these few with hostility or on the teacher with bitterness.

At the other extreme are those teachers who feel that the class has no right to participate at all. "After all, how would they know what to do? It's up to me to handle this. If I can't do it, they certainly can't. Anyway, I'm in charge here." Teachers with this attitude stifle any class participation in the solution of discipline problems.

A more feasible course of action would seem to be for teacher and students to share the responsibility for coping with problems that involve them all. The technique of allowing the group to discuss grievances under adult guidance is often called *ventilation*. This process requires a generally permissive attitude so that students will feel free to vent their feelings about classroom conditions, even when their complaints reflect unfavorably on the teacher. The teacher plays a vital role in the discussion, pointing out and raising issues.

Ventilation is no simple process, for it may mean bringing hidden feelings and attitudes into the open. Breaking the dam of repression can produce anxiety. When the group and the teacher have had little experience, it is well to proceed slowly and cautiously. Often a teacher who thinks he wants to know how everyone feels is noticeably shocked when the truth is out. However, free discussion among the students, especially if there is internal conflict in the group, gives the teacher an opportunity to gain insight into the dynamics of the group. He can see how the students relate to each other as he observes their rejection or acceptance of one another. But social tensions may flare into embittered statements. The teacher's task is to help preserve a purposeful tone and to help the students see why they are reacting as they are.

Why is ventilation helpful? It can locate the source of the trouble. Energy used in covering up is now available for constructive efforts. Defensive reactions are no longer necessary. Everyone has had a chance to look at the problem and to share in the responsibility for its solution. Sometimes the consequences are so intense that any solution seems impossible. There may be deep antagonisms that predict "civil war" or dissatisfaction with a curriculum that cannot be changed

because of the community educational design. Ventilation in and of itself is no cure; it is helpful only if the material produced in this way can be used by the group, with the teacher's guidance, to solve the problems they face or to learn to understand and accept conditions that cannot be changed.

The group cannot effectively discuss and resolve its problems, particularly its behavior problems, unless class standards for acceptable behavior are well defined and clearly understood by all. In Chapter 8 we discussed some of the ways in which principles of conduct can be imparted in the classroom. Subject matter often deals with values. Stories in readers and selections from literature abound with situations in which values are at stake. History itself is a moral epic.

Sometimes these values and motives do not stand out for the student. Both in lesson content and in daily activities, values need to be pointed out by the teacher and explored and considered by the class so that they are understood realistically. A principle of conduct that is accepted simply on the basis of an inclination to moral "goodness" may lead to rigid behavior or may not stand up under a critical test. Children need to think through moral principles if they are to apply them realistically.

The most effective guides to group action are standards that the students have shared in establishing. They will feel more responsible for keeping standards which are their own. Yet the teacher must guide the process of establishing standards so that they will be realistic for the age and developmental level of the group. Especially in the lower grades, children need guidance to set standards that will not later prove frustrating and discouraging to them.

Understanding of values and motives can be promoted by group analysis as the opportunity arises. For instance, Sue may ask her teacher, "What can you do when your parents make you come home earlier than everyone else?" Here is a chance to explore and clarify value problems that trouble young people. Another way to make them visible is to have the students write about them in papers and critical essays. Some schools have developed discussion classes, usually led by a specialist, where the less well-adjusted pupils can work through their problems. Positive results are reported in regard to self-esteem, ego functions, and relationships with peers and authorities (Belenky, 1965; Field, 1966).

It should be recognized that the motivation for proper behavior is a consequence of the incorporation of acceptable value patterns through long-term identification with adequate adults. It is necessary to distinguish problems in values from conditions where the youngster's knowledge of what he should do is in advance of what he actually does. Too many times correct behavior is agreed on but not carried out. As we saw in Chapter 8, values must go beyond words if they are to become part of one's behavior. The teacher often finds instances where verbally accepted standards can be translated into actual behavior. Providing opportunities for students to make and carry out decisions gives them valuable practice in taking responsibility, in learning self-management, and in putting values to work.

There are many ways in which this can be done. A first-grade class talking about the concept of sharing may apply it to the problem of sharing playground equipment, ideas, friendship, and certain possessions. The teacher must then see to it that opportunities to practice sharing are provided. A fourth-grade class talking about humane treatment of animals can raise pets in the classroom and

apply new values of animal care to the pets they have at home. Members of a junior-high class whose school population is made up of several ethnic groups and various social levels can examine their own actions to see if their acceptance of cultural subgroups is real or merely verbal. In one case, it took the story of a Mexican boy's trials in adapting to an American community to make the members of a class aware that a similar situation existed in their own class.

THE NEED FOR OUTSIDE SUPPORT

It is often true that a simple infraction requires "total treatment." The infraction itself may not be catastrophic, but it is symptomatic of the pupil's behavior and has to be pushed to a solution. Sometimes incidents that do not interfere with the teaching process can be ignored; it is seldom advantageous to have a show of power for its own sake. For example, a fourth-grader who refuses to take off his overcoat can be ignored if no one else is likely to follow suit, or a junior-high pupil who won't sit in a given seat but insists on one in the back of the room can be allowed to do so. But there are times when refusals to comply with requirements cannot be ignored even though in themselves they are not really worth doing something about. When it is clear that an incident is of this nature and needs more than casual attention, the end may be a long way down the road. And usually something beyond the efforts of the individual teacher is needed.

"Back-up support" is the availability of help from outside the classroom. Teachers often say that if they have it they don't need to fall back on it but if they don't have it, it becomes critical. This is because a youngster who realizes there is no higher authority will often exploit the teacher's lack of power.

It is most important that the principal be fully aware of what is going on in the school. This means that he does not blindly back up a teacher no matter what. He acts for what are essentially reasonable mores for the school culture. At best, he helps the pupil and the teacher sort out values and motivations. It sometimes happens that the teacher has made a mistake in judgment which becomes evident as the matter is discussed. Then there usually is great anxiety about saving face on the part of the adults, since the pupil's need to save face seldom is considered. In truth there is no real place for face-saving. The object should be to work out a reasonable resolution to the difficulty as it comes to be understood. We shall return to this point in the next chapter.

There are times when a principal, thinking to bolster a teacher who is having problems, becomes over-severe in his disciplinary approach. This may make the pupil resent the teacher who referred him, or cause the teacher to think twice about putting the pupil in a position where he may receive physical punishment or expulsion.

Teachers need support from the pupil's home as well as from school authorities.¹¹ In conferring with the parents about a discipline problem, the basic tactic is

¹¹The role of parents in matters of discipline is discussed in "Consequences of Different Kinds of Parental Discipline" by W. C. Becker (In M. L. Hoffman and L. W. Hoffman, Eds., *Review of Child Development Research*, Vol. 1. New York: Russell Sage Foundation, 1964) and in "Parents' Attitudes and School Discipline" by M. L. Carter (*Education*, 1964, 85, 112-116).

not to announce arbitrarily what is going to be done, but to describe the difficulty and what has been tried. What might they suggest? Often the parents' help will be all that is needed to reverse the trend. In other cases, the need for a great deal of outside help may be uncovered.

As can be envisioned, the mood of the community at large is also a factor in the amount of back-up support available to the teacher. If defiance of authority makes one a hero in the neighborhood, the teacher has a powerful force to contend with. Where both the peer group and adult society reinforce deviant behavior, discipline problems are increased. The situation in a community where dropping out of school before graduation is common is quite different from that in an area where every youngster is expected to finish school at all odds. The pervasive nature of such often unspoken values may undermine the best in-school support a teacher can have.

Reading

David P. Ausubel

SOME MISCONCEPTIONS REGARDING MENTAL HEALTH FUNCTIONS AND PRACTICES IN THE SCHOOL

The author of this selection discusses the problem of discipline in the light of the school's primary function and its proper role in the development of mental health and personality development. He also takes a sharp-eyed look at what passes for "democratic classroom discipline" in some schools today and suggests what such a term should really mean.

Most reasonable persons would agree today that the legitimate functions of the school extend beyond the development of intellectual skills and the transmission of subject-matter knowledge. The school also has undeniable responsibilities with respect to mental health and personality development, simply because it is a place where children spend a good part of their waking hours, perform much of their purposeful activity, obtain a large share of their status, and interact significantly with adults, age-mates, and the demands of society. Hence, as long as the organizational, administrative, disciplinary, and interpersonal aspects of the school environment inevitably affect the mental health and personality development of its future citizens, it obviously behooves society to arrange these matters as appropriately and constructively as possible. Nevertheless, because the mental hygiene role of the school has been oversold and misrepresented so frequently by educational theorists, I would like to consider in this article what I believe to be some of the more serious misconceptions about mental health functions and practices in the school setting.

The primary responsibility of the school

To begin with, I think we need to recognize that the primary and distinctive function of the school in our society is not to promote mental health and personality development but to foster intellectual growth and the assimilation of knowledge. The school admittedly has important responsibilities with regard to the social, emotional, and moral aspects of the pupil's development, but certainly not the primary responsibility; the school's role in intellectual development, however, is incontrovertibly primary. Furthermore, much of the school's legitimate concern with interpersonal relations in the classroom does not stem merely from interest in enhancing healthful personality development as an end in itself. It also reflects appreciation of the negative effects which an unfavorable social and emotional school climate has on academic achievement, on motivation to learn, and on desirable attitudes toward intellectual inquiry. For example, if pupils feel unhappy and resentful about the discipline and social environment of the school, they will neither learn very much while they are in school nor remain much longer than they have to. And if they are goaded by fear to accept uncritically the views of their teachers and to memorize materials they do not really understand, they neither learn how to think for themselves nor build the foundations of a stable and usable body of knowledge. . . .

The cult of extroversion

In education, as in many other vocational fields, we have succumbed to the cult of the warm, outgoing, amiable, and extroverted personality, and have tended to regard any deviation from this standard as axiomatically undesirable from a mental hygiene standpoint. Formerly a pupil would be referred to the school psychologist if he was boisterous, aggressive, and refractory to discipline. Now it is the child who is reserved, contemplative, and unconcerned about the opinion of his peers who arouses the clinical concern of the child guidance specialist. Similarly, many excellent teachers who happen to be shy and introverted are viewed with alarm by their psychologically oriented superiors. Yet there is absolutely no evidence that they impair their pupils' mental health, even though they may conceivably be less popular as individuals than their extroverted colleagues; and as far as pupils are concerned, it has been definitely established that popularity may be a grossly misleading index of social adjustment. An ostensibly popular individual may be little more than a "stranger in his group" in terms of the depth of his attachments, or may be popular simply because he is docile, conforming, and willing to be directed and "used" by others (Wittenberg & Berg, 1952). Contrariwise, the pupil who is unpopular because of temperamental shyness or strong intellectual interests is not necessarily socially maladjusted or inevitably fated to become so (Morris, Soroker, & Burruss, 1954).

The effects of authoritarianism

Many educators have uncritically accepted the ethnocentric psychological dictum that only democratic teacher-pupil relationships are compatible with normal

mental health and personality development. Yet there are many examples of authoritarian western cultures (e.g., Germany, Italy, Switzerland) in which all of the indices of mental health and mature personality development compare very favorably with those prevailing in the United States. . . .

Older children and adolescents do not satisfactorily internalize values that are indoctrinated in an authoritarian fashion if the adult culture itself is organized along democratic and egalitarian lines. Under these circumstances they feel unjustly treated and discriminated against; and not only do they tend to resent the authoritarian discipline that is imposed upon them, but also to conform to adult standards only under threat of external compulsion. This is particularly true if they perceive that many adults do not honor these standards but nevertheless presume to punish them whenever they are guilty of lapses. Hence, when adults preach the virtue of hard work, ambition, responsibility, and self-denial, but do not practice these virtues themselves in occupational life, children tend to emulate their example rather than their precepts. They become habituated to striving and working hard under external pressure but fail adequately to internalize these values. Thus when they finally enter the adult vocational world and the customary authoritarian demands for conscientious effort are lifted, the tenuous structure of their disciplined work habits tends to collapse in the absence of genuinely internalized needs for vocational achievement. . . .

Distortions of democratic discipline

Proponents of democratic classroom discipline believe in imposing the minimal degree of external control necessary for socialization, personality maturation, conscience development, and the emotional security of the child. Discipline and obedience are not regarded as ends in themselves but only as means to these latter ends: They are not striven for deliberately, but are expected to follow naturally in the wake of friendly and realistic teacher-pupil relationships. Explicit limits are not set routinely or as ways of showing "who is boss," but only as the need arises, i.e., when they are not implicitly understood or accepted by pupils.

Democratic discipline is as rational, nonarbitrary and bilateral as possible. It provides explanations, permits discussion, and invites the participation of children in the setting of standards whenever they are qualified to do so. Above all it implies respect for the dignity of the individual, and avoids exaggerated emphasis on status differences and barriers between free communication. Hence it repudiates harsh, abusive, and vindictive forms of punishment, and the use of sarcasm, ridicule, and intimidation.

The aforementioned attributes of democratic classroom discipline are obviously appropriate in cultures where social relationships tend to be egalitarian. This type of discipline also becomes increasingly more feasible as children become older, more responsible, and more capable of understanding and formulating rules of conduct based on concepts of equity and reciprocal obligation. But contrary to what the extreme permissivists would have us believe, democratic school discipline does not imply freedom from all external constraints, standards, and direction, or freedom from discipline as an end in itself. And under no circumstances does it presuppose the eradication of all distinctions between pupil and

teacher roles, or require that teachers abdicate responsibility for making the final decisions in the classroom.

Many educational theorists have misinterpreted and distorted the ideal of democratic discipline by equating it with an extreme form of permissiveness. These distortions . . . have been dogmatically expressed in various psychologically unsound and unrealistic propositions that are considered sacrosanct in many teachers' colleges. Fortunately, however, most classroom teachers have accepted them only for examination purposes—while still in training—and have discarded them in actual practice as thoroughly unworkable.

According to one widely held doctrine, only "positive" forms of discipline are constructive and democratic. It is asserted that children must only be guided by reward and approval; that reproof and punishment are authoritarian, repressive, and reactionary expressions of adult hostility which leave permanent emotional scars on children's personalities. What these theorists conveniently choose to ignore, however, is the fact that it is impossible for children to learn what is *not* approved and tolerated, simply by generalizing in reverse from the approval they receive for behavior that *is* acceptable. Even adults are manifestly incapable of learning and respecting the limits of acceptable conduct unless the distinction between what is proscribed and approved is reinforced by punishment as well as by reward. Furthermore, there is good reason to believe that acknowledgment of wrong-doing and acceptance of punishment are part and parcel of learning moral accountability and developing a sound conscience. Few if any children are quite that fragile that they cannot take deserved reproof and punishment in stride.

A second widespread distortion of democratic discipline is reflected in the popular notion that there are no culpably misbehaving children in the classroom, but only culpably aggressive, unsympathetic, and punitive teachers. If children misbehave, according to this point of view, one can implicitly assume that they must have been provoked beyond endurance by repressive and authoritarian classroom discipline. Similarly, if they are disrespectful, then the teacher, by definition, must not have been deserving of respect. It is true, of course, that much pupil misconduct is instigated by harsh and abusive school discipline; but there are also innumerable reasons for out-of-bounds behavior that are completely independent of the teacher's attitudes and disciplinary practices. Pupils are also influenced by factors originating in the home, the neighborhood, the peer group, and the mass-media. Some children are emotionally disturbed, others are brain-damaged, and still others are aggressive by temperament; and there are times when even the best behaved children from the nicest homes develop an irresistible impulse—without any provocation whatsoever—to test the limits of a teacher's forbearance.

Both of the aforementioned distortions of classroom democracy are used to justify the commonly held belief among educators that pupils should not be reproved or punished for disorderly or discourteous conduct. I have, for example, observed classrooms where everybody talks at once; where pupils turn their backs on the teacher and engage in private conversation while the latter is endeavoring to instruct them; and where pupils verbally abuse teachers for exercising their rightful disciplinary prerogatives. Some educators contend that all of this is compatible with wholesome, democratic teacher-pupil relationships. Other educators deplore this type of pupil behavior but insist, nevertheless, that

punishment is unwarranted under these circumstances. In the first place, they assert, reproof or punishment constitutes a "negative" and hence axiomatically undesirable approach to classroom management; and, secondly, the misbehavior would assuredly have never occurred to begin with, if the teacher's attitudes had been less autocratic or antagonistic. I have already answered the second group of educators, and to the first group I can only say that I am still sufficiently old-fashioned to believe that rudeness and unruliness are not normally desirable classroom behavior in any culture.

When such misconduct occurs, I believe pupils have to be unambiguously informed that it will not be tolerated and that any repetition of the same behavior will be punished. This action does not preclude in any way either an earnest attempt to discover why the misbehavior occurred, or suitable preventive measures aimed at correcting the underlying causes. But, by the same token, the mere fact that a pupil has a valid psychological reason for misbehaving does not mean that he is thereby absolved from moral accountability or rendered no longer subject to punishment.

Still another related distortion of democratic discipline is reflected in the proposition that it is repressive and authoritarian to request pupils to apologize for discourteous behavior or offensive language. However, if we take seriously the idea that the dignity of the human being is important, we must be willing to protect it from affront; and apology is the most civilized and effective means mankind has yet evolved for accomplishing this goal. In a democratic society nobody is that important that he is above apologizing to those persons whom he wrongfully offends. Everybody's dignity is important—the teacher's as well as the pupil's. It is no less wrong for a pupil to abuse a teacher than for a teacher to abuse a pupil.

If apologies are to have any real significance in moral training, however, it is obvious that, even though they are explicitly requested, they must be made voluntarily, and must be reflective of genuine appreciation of wrong-doing and of sincere regret and remorse. Purely formal and mechanical statements of apology made under coercion are less than worthless. Apologies are also without real ethical import unless their basis is reciprocal, i.e., unless it is fully understood that under comparable circumstances the teacher would be willing to apologize to his pupils.

In seeking to correct these undesirable permissive distortions of classroom democracy, it would be foolhardy to return to the equally undesirable opposite extreme of authoritarianism that flourished in the United States up to a quarter century ago, and still prevails in many western nations. Democratic school discipline is still an appropriate and realistic goal for education in a democratic society; hence there is no need to throw away the baby with the bath water. It is only necessary to discard the aforementioned permissivist doctrines masquerading under the banners of democracy and behavioral science, and to restore certain other traditional values that have been neglected in the enthusiasm of extending democracy to home and school.

More specifically, we first have to clear up the semantic confusion. We should stop equating permissiveness with democratic discipline, and realistic adult control and guidance with authoritarianism. Permissiveness, by definition, is the absence of discipline, democratic or otherwise. We should cease instructing

teachers that it is repressive and reactionary to reprove or punish pupils for misconduct, or to request them to apologize for offensive and discourteous behavior.

Second, we should stop misinterpreting what little reputable evidence we have about discipline, and refrain from misrepresenting our personal biases on the subject as the indisputable established findings of scientific research. The available evidence merely suggests that in a democratic cultural setting, authoritarian discipline has certain undesirable effects—not that the consequences of laissez-faire permissiveness are desirable. As a matter of fact, research studies (Cunningham, 1951) show that the effects of extreme permissiveness are just as unwholesome as are those of authoritarianism. In the school situation a laissez-faire policy leads to confusion, insecurity, and competition for power among pupils. Assertive pupils tend to become aggressive and ruthless, whereas retiring pupils tend to withdraw further from classroom participation. The child who is handled too permissively at home tends to regard himself as a specially privileged person. He fails to learn the normative standards and expectations of society, to set realistic goals for himself, and to make reasonable demands on others. In his dealings with adults and other children he is domineering, aggressive, petulant, and capricious.

Third, we should stop making teachers feel guilty and personally responsible for all instances of misconduct and disrespect in the classroom. We do this whenever we take for granted, without any actual supporting evidence, that these behavior problems would never have arisen in the first place if the teachers involved were truly deserving of respect and had been administering genuinely wholesome and democratic discipline.

Finally, teachers' colleges should terminate the prevailing conspiracy of silence they maintain about the existence of disciplinary problems in the schools. Although discipline is the one aspect of teaching that the beginning teacher is most worried about, he receives little or no practical instruction in handling this problem. Many teacher training institutions, as pointed out above, rationalize their inadequacies in this regard by pretending that disciplinary problems are relatively rare occurrences involving the disturbed child, or more typically the disturbed teacher. Due respect for the facts of life, however, suggests that prospective teachers today not only need to be taught more realistic propositions about the nature and purposes of democratic discipline, but also require adequately supervised, down-to-earth experience in coping with classroom discipline.

SOCIAL AND EMOTIONAL PROBLEMS IN THE CLASSROOM

Some school discipline problems are largely the product of a single individual or a few individuals who have personality difficulties. The curriculum may be fair and within reason and the teacher may show great skill in working with the group, and still there may be behavior difficulties. They happen in the best of classrooms.

One important factor that should be recognized here is the fact that, of necessity, the school requires a high degree of conformity from those who attend it. There is no comparable institution in the culture that puts such exacting, near-identical demands on all adults. The pressure to adjust to academic demands, even when applied with utmost insight, is not going to fit all pupils.

When classroom problems seem to stem from the behavior of an individual, the teacher needs first of all to be sure that the child's behavior really is deviant.¹ Personality clashes between teacher and pupil or pupil and pupil may be unpleasant but do not necessarily reflect adjustment problems of either party. No one gets along easily with everyone he meets.

Sometimes we try too hard to understand a child's behavior, spinning out some involved psychological explanation for misbehavior when the actual reason is quite simple. Surely you have felt your exuberant spirits rebelling at controls and rules at one time or another. Younger children especially are so vitally concerned with exploring their world, with experimenting in all sorts of new and fascinating ways, and with filling each moment with some spirited activity that they simply cannot be bothered to be quiet and focus their attention on any one thing for very long.

¹An excellent manual with techniques for identifying children who need special help is E. M. Bower's *Early Identification of Emotionally Disturbed Children in School* (Columbus, O.: Thomas, 1960). Bower has developed an ingenious device for the identification of emotionally disturbed children in which pupils are asked to choose classmates for various parts in a class play, to say what parts they might play themselves, and to indicate what parts they think their teacher would give them. See also Bower's article "A Process for Identifying Disturbed Children" (*Children*, 1957, 4, 143-147).

Sometimes, too, adults worry too much about undesirable or irritating behavior that children will outgrow. Some of the common age-related characteristics already mentioned are in this category, such as the boisterousness typical of the four-year-old and the untidiness and overconcern with self commonly seen in early adolescence. Often children whose behavior disrupts the classroom are not really maladjusted but simply need further guidance and encouragement and more years to become socially acceptable adults. We are apt to be especially impatient with adolescents, who usually look more adult physically than they actually are emotionally and socially.

Problem behavior not related to age is sometimes outgrown, too. In one study a group of children who showed symptoms of emotional disturbance, such as restlessness, daydreaming, anxiety, fear, nervous habits, lying, and psychosomatic disorders, showed markedly fewer of these symptoms a year later. The older the child, however, the less the likelihood of spontaneous improvement. And behavior patterns such as daydreaming and lack of concentration were characteristically resistant to change. Only a little improvement was noted in the seriously disturbed children (Cummings, 1946). Obviously some behavior problems, far from disappearing spontaneously, can be expected to become worse if they are not handled wisely in their embryo stage.

CHILDREN WHO NEED SPECIAL HELP

According to a recent survey of research made by Glidewell, nearly a third of all elementary-school pupils present some problems of maladjustment. About 10 per cent of the total number of pupils show problems severe enough to merit clinical attention.² It is also true that more and more adolescents are being found in serious trouble. Indeed, many are so deviant that institutionalization would seem to be the only way to help them—if sufficient facilities were available. In this chapter we shall examine the problems of these young people who are having difficulties in adjustment and see what the teacher can do to help them.

Dynamics of problem behavior

In any community, there are usually some youngsters who are excluded from school because the schools cannot cope with them. In some cases the percentage may be small, as in a study made in Los Angeles, where the 661 excluded pupils represented .2 per cent of the elementary-school-age population (Lyons and Powers, 1963). Some districts have a higher proportion of exclusions. The major cause is emotional instability or hyperkinetic (overactive) behavior. Aggressive and antisocial behavior is also a prevalent cause, with psychosis being a less frequent reason. The criterion is ability to tolerate (or be tolerated in) the school situation. While some of these children eventually return to regular classes at least

²These findings are reported in detail in *The Prevalence of Maladjustment in Elementary Schools*, by John C. Glidewell and Carolyn Swallow (Chicago: University of Chicago, 1968. Mimeographed).

part time, placement in special classes or in private or public facilities is the most frequent disposition. There are never enough resources for such problems. Any teacher, even in the more favored system, can point to children for whom regular public-school resources are not enough—and yet there they sit, at least part of the time, in the regular classroom.

Estimates vary on how many children have social-emotional problems intense enough to require special services.³ Few put it below 10 per cent, although our own studies have not indicated quite so high a percentage. Of the total population at least 3 per cent are deviant enough to require fairly intensive help, and 1 per cent may not be able to make it in the school setting even with such help.

It is the teacher's job to screen children for more professional diagnosis and planning. While this is most frequently done on the basis of obvious problem behavior, it can be done using systematic approaches such as Bower (1960) has devised. There are three main sources of information: (1) teachers, who are trained to be reasonably good recognizers of social deviancy, though less so with cases of internal strife; (2) peers, who by rating and sociometric devices can give a picture of how the individual is perceived socially; and (3) self, through such scales as the California Personality Inventory or the Coopersmith Self-Esteem Inventory (Coopersmith, 1967). By combining information from these three sources, it is possible for a teacher or guidance worker to identify those children who are in need of professional diagnosis. The school is the major source of referrals to clinics. It is important that recognized atypicality be referred for complete study and parental consultation before it has become too costly or even impossible to help. To maintain a severely disturbed child in school when no real help can be given there is seldom any long-term advantage to the child, his family, or the community as a whole.

What types of problems are referred for study? Gilbert (1957) studied 2500 referrals of children from preschool age through age eighteen; his findings are summarized in the chart. Of course, many children display more than one symptom.

Problem	Percentage of total cases	Type of clinic	
		Community	School
Academic Difficulties	45%	27%	56%
Retardation	27	6	40
Aggressive, Antisocial	30	45	20
Passive, withdrawn	22	32	14
Emotional instability and anxiety	23	34	16
Hyperactivity	14	22	8
Sexual problems	2.5	4	1
Toilet training	6.5	12	1
Speech	6.5	6	7
Miscellaneous	14	20	9

It must be recognized that some school behavior problems have their roots on the outside; family disturbances usually have their counterparts in school, though

³An interesting issue is undetected maladjustment, especially in upper-class youngsters. For a discussion, see "Hidden delinquency and social status" by L. T. Empey and M. L. Erickson (*Social Forces*, 1966, 44, 546-554).

there are cases where school is a compensatory field for the child, his one hold on good adjustment though virtual chaos reigns outside. Other children are well-adjusted at home and in the neighborhood but find their nemesis in the school environment—though here too problems may expand to permeate the whole of life. It is particularly important that the school prevent problems which fall in its own domain. This is in fact the saddest case of all, where educational malfunction provokes failure and subsequent erosion of self-esteem.

Of course, symptoms do not tell the nature of the underlying problem. A child who is antisocial may be delinquent, anxiety-ridden, or retarded. It requires astute analysis to make a differential diagnosis—putting symptoms together in some meaningful way with predominant causes indicated.⁴

Another study (Bohn and Norman, 1959) surveyed the disorders represented among 34,000 children referred to mental health clinics. The findings are presented below:

Organic syndromes	7%
Mental deficiency	18
Psychotic	4
Neurotic	14
Personality disorders	21
Transient-situational disorders	36

Bear in mind that the clinic group represents about 3 per cent of the total child population. The organic syndromes are those associated with brain injury and neurological dysfunction, considered in earlier chapters. Mental deficiency has also been discussed. The psychotic include autistic and other types of schizophrenic children. They cannot judge reality, have bizarre mannerisms, are preoccupied with bits and pieces of their environment. Neurotic disorders are characterized by anxiety and guilt, though of course the child may not admit or even realize his underlying tensions. Often the overanxious child is pressed by the teacher, and the load of guilt induced is too much. Some neurotic children act out their aggression against the environment; others turn it inward on themselves with accompanying withdrawal and feelings of inadequacy. Most of these children have a poor self-concept. The personality or character disorders range from the psychopath, without any concern for others, to children who have an inadequate (but not absent) conscience. They, too, tend to act out, and are skillful at avoiding being pinned down. Teachers who count on the arousal of guilt feelings as a means of control, constantly pointing out what a child has done wrong, are likely to be at a loss with these children. They have little concern for anything but their own impulses. Transient-situational disorders are psychosis-like "shock" reactions to some traumatic or terrifying occurrence in which the child's world has been suddenly "turned upside down." By the time there has been a spreading from specific symptoms to a general personality reaction, it is very difficult to reverse the process through school efforts alone. Any child who is "different" has a harder time fitting into classroom patterns established by the teacher and his more

⁴For an interesting "objective" approach to classification, see "Some correlates of personality disorder and conduct disorder in a child guidance clinic sample" by H. C. Quay, R. L. Sprague, H. S. Shulman, and A. L. Miller (*Psychology in the Schools*, 1966, 3, 44-47).

average classmates. The youngster with exceptionally high or low intellectual capacity, with a low achievement level, with a physical handicap, or with divergent values has a factor to cope with in growing up that the others do not face. Negative feelings and attitudes about being "different" may become a serious handicap.

Some children show problem behavior in school because they come from homes and communities with alien social values. They do not value books or intellectual pursuits and gain status at home if they "stand up" to the teacher. They expect school experiences to be a running battle with the authorities, and they actually gain security and pride from the concern they manage to evoke in the adults of this alien culture.

The sad fact is that of the 10 per cent who need mental health assistance, we are fortunate if a fifth get it. In a report made by one of the authors for the Mental Health Department in Michigan, adolescents were found to be getting relatively least help. Children referred to the courts because of delinquency were being handled without the needed specialized help—even though a child who breaks the law may need psychiatric help more than anything else. All services have long waiting lists and are trying to give as much help as they can despite inadequate resources. Many children who need institutionalized milieu treatment are walking the streets—and some are in classrooms where they make little progress and cause a great deal of confusion among teachers and peers.⁵

This brings up the problem of delinquent behavior, which is coming to be a major school concern. The authors take the point of view that delinquency is not a diagnostic category, for children suffering from widely varying disturbances may commit delinquent acts. Bennett (1960) has suggested that while the behavior of so-called delinquent and neurotic children is similar, most true delinquents lack a sense of guilt or shame; they have "arrested" or "distorted" consciences. In some instances, however, delinquents appear to be intensely loyal—but to the "wrong crowd." In either case, the fundamental problem is one of values. Control of such youngsters is very difficult and limit-setting is discouraging in many cases, but we must still try.

Actually what the schools call delinquent behavior is often compounded of several factors including defiance and hostility.⁶ But many nondelinquent lower-class children and young people are reacting not out of a moral deficiency but a social difference. School is not useful or meaningful to them, and in their frustration they evade and defy its pressure. They are angry youngsters with good cause.

On the other hand, there are the youngsters who are too anxious over grades, too eager to beat everyone in the class, and too worried over their schoolwork. These too-hard-working youngsters may please the unknowing teacher but not the one who understands the dynamics of behavior.

Essentially, problem behavior indicates that the basic needs of the child are not being met or have not been met in the past. When a child consistently shows

⁵For those who wish a more extensive discussion of these problems the following three books are recommended: *Psychopathology of Childhood*, by J. W. Kessler (Englewood Cliffs, N.J.: Prentice-Hall, 1966); *The Psychiatric Disorders of Childhood*, by C. R. Shaw (New York: Appleton-Century-Crofts, 1966); and *Learning and its Disorders*, by I. N. Berlin and S. A. Szurek (Palo Alto: Science and Behavior Books, 1965).
⁶Specific and detailed help for the teacher can be found in *Anxious Youth: Dynamics of Delinquency*, by W. C. Kvaraceus (Columbus, Ohio: Merrill, 1966).

symptoms of aggression, withdrawal, or self-depreciation, you can suspect that there has been a serious failure to meet his basic needs.⁷

Usually such patterns have developed gradually through a long process of interaction between the child and his environment. Sometimes, of course, special dislocations of security such as divorce, illness, death, new brothers and sisters, or economic difficulties show up in problem behavior in the classroom, but most often the behavior that the teacher sees has been learned bit by bit over a long period of time and has become firmly entrenched. The child will cling to it because it is familiar and the safest thing he knows. Frontal attempts to change him imply criticism and hence will usually arouse resistance and defensiveness. The "problem child" is likely to be a deeply discouraged child. But unhappy and discouraged as he may be, he fears to take chances and hangs onto familiar responses, however inadequate.

Our understanding of the relation between frustration and problem behavior is a comparatively recent one and even now does not always determine our reaction to behavior that we find irritating or disruptive. Early advice on child-rearing stressed the need for restraining certain "natural" impulses and inducing desired behavior through "habit training" with little apparent awareness of the dynamic factors behind children's behavior or the relation between behavior and emotional health or ill health.

Teacher attitudes toward problem behavior

In a classic study by Wickman (1928) teachers and mental hygienists were asked to rate the seriousness of thirty types of problem behavior. Unfortunately, the teachers were asked to give quick judgments whereas the mental hygienists were encouraged to consider the *long-term* seriousness of the behavior. This difference in instructions may have been partly responsible for the great discrepancy in the ratings given by the two groups. Be that as it may, there was actually a negative correlation between the two sets of ratings. The teachers rated immorality, dishonesty, and transgression against authority as more serious than behavior indicating withdrawal, unhappiness, or fearfulness. The ratings of the two groups agreed in only four cases.

Almost twenty-five years later Stouffer (1952) repeated Wickman's study, having a teacher group rate the problems first according to the original directions and then a second time according to the directions given the clinicians. This time, for both sets of ratings, there was a low positive correlation between the ratings of the teachers and the clinicians, the second set of teacher ratings being somewhat closer than the first to the clinicians' ratings. Stouffer concluded that in the intervening years teachers had come closer to the mental hygienist's view of what behavior is indicative of unhealthy, unsatisfactory adjustment but that there were still differences. He wrote:

⁷For a more detailed analysis of the relation between need frustration and problem behavior, see *An Application to Education of the Needs Theory*, by L. E. Rath (Bronxville: Modern Education Service, 1949). For clues to understanding behavior in terms of its conscious and unconscious purposes, see R. Dreikurs' *Psychology in the Classroom* (New York: Harper & Row, 1957).

... It would seem that the behavior-problem child in school is still, as he was twenty-five years ago, identified chiefly by annoying, disorderly, irresponsible, aggressive, untruthful, and disobedient behavior. Teachers of to-day, however, are not so oblivious to behavior indicative of social and emotional maladjustment as were those reported in Wickman's inquiry. (pp. 282-283)

Ever since the Wickman study, teachers have been accused of being aware only of behavior problems involving defiance of authority—and then more from the point of view of maintaining order than of getting at the problem behind the symptom. But recent long-term studies of adjustment, such as that of Robins (1966), indicate that they may have been on the right track after all. Such studies indicate that antisocial behavior may indeed be predictive of future maladjustment. It has been found, for example, that a complex of antisocial behavior and an antisocial male parent is indicative of both social deviancy and mental illness in later life. The inability to meet reasonable social demands is a significant indicator deserving of the school's concern.

Furthermore, those who criticize may not be fully aware of the havoc that a disruptive individual can cause in a classroom group or of how responsive the rest of the class is to such deviancy. The pupil who once remarked, on noting the absence of a very disturbed and disturbing classmate, "Maybe John is dead," did so with hope in his voice. What normal adult would want to be forced to live and work day in and day out with severely disturbed associates to whom he had to make continuous adjustments?

Teachers must, first of all, "manage" their classes—create an orderly structure in which constructive work can go on. In our work with teachers, it has become clear that after this condition is met, they do, by and large, show cognizance of other types of problems (Morse, 1961). But even with a good understanding of the dynamics of behavior, a teacher cannot, in a classroom, establish the atmosphere of acceptance and permissiveness that is possible in a therapist's office. So the question may be raised as to how much agreement there *should* be in rating "seriousness of problems" between a clinician, who usually sees children individually, and a teacher who must handle them in groups and is charged with producing academic achievement up to a specified level. The differences in their roles would seem to justify some differences in problem weighting and, as Robins' work seems to indicate, the clinicians may not be entirely correct.

Teachers have been so bombarded with the "mental health" point of view that they have sometimes felt guilty about not doing the impossible and have suffered considerable uneasiness and uncertainty as to just how far they could and should go toward assuming the therapist's role. In particular, they have heard so much about "acceptance" and "permissiveness" that they have sometimes felt guilty at showing firmness or taking active steps to maintain order.

APPROACHING PROBLEM BEHAVIOR

Most beginning teachers will need a good deal of experience before they can distinguish clearly what misbehavior should be overlooked and what should be

dealt with. The teacher who makes an issue out of each whisper or every squirm is no more a mature, effective teacher than the one who closes his eyes to obvious pandemonium. It is difficult to distinguish between forms of problem behavior which will become worse if the teacher ignores them and those which will become worse if he draws attention to them.⁸

Behavior that can safely be ignored in one situation may be a signal of real trouble in another. The particular measures that a teacher employs are not nearly so important as is the manner in which he approaches the problem of discipline. Often it is not what he says or does but how he says and does it that reveals to the children his actual motivations as well as his own confidence or uncertainty.

Looking beyond the symptom to the cause

In coping with problem behavior, the key is to try always to respond to the child's *motivation* in his misbehaving rather than to the particular symptom he chooses. The important thing is not the *behavior* he is showing—the apparent laziness, the defiance, the striving for attention, or whatever—but *what he is consciously or unconsciously trying to achieve by his behavior*. The teacher who is perceptive enough to find out what a child is really after, and why, can often help him to find a more constructive way to attain it, or in some cases, to set better goals.

The fallacy of responding only to symptoms is shown in the case of a second-grade child who began to demand a great deal of attention. The little girl cried when her mother left after bringing her to school and even became upset when the teacher left the room or paid much attention to another child. The teacher thought at first that this was a “spoiled child,” a child who had been pampered and had learned to expect too much from adults. She decided to ignore the child, feeling that once the girl found that the attention she was demanding was not going to be forthcoming she would begin to behave in a more acceptable way.

But the opposite happened. The child became more demanding than ever and now showed a fear verging on panic. One day she blurted out that her daddy was going away just the way her grandpa had. It developed that the child was very anxious over losing people and that the mother herself, in the turmoil of a divorce, had been unable to meet the child's need for dependable affection and closeness.

So the teacher reversed her stand, “attended” to the child as much as possible, reassured her that her mother would be back at the end of the day, and carefully explained ahead of time whenever she herself would be gone. In a short time, the child had gained enough confidence to enable her to leave the adult, play with other children, and begin to make a better adjustment in school.

Another case concerns a high-school student, a fine boy of superior intelligence who was pleasant to his classmates and, if anything, overcompliant to his teachers. They were perplexed because he seemed lazy—behavior which they regarded as quite inexcusable considering his potential. Yet the more pressure

⁸The work of Fritz Redl has been cited previously. The authors would urge any teacher to study his volume *When We Deal with Children* (New York: Free Press, 1966). It is almost impossible to select from this most important volume, but the sections on Life Space Interviewing, Therapeutic Milieu, Groups, Punishment and Delinquency should certainly be read.

they put on him, the more he daydreamed and "forgot" his assignments. At the same time, it was noticed that this "lazy" boy practiced his sports to the point of exhaustion and never had to be pushed to practice his trumpet. So he was given failing grades in school not only because his achievement was marginal, but because it was thought this would "motivate" him. Instead of working harder, however, he withdrew more and began to be more openly resistant.

It took considerable time to get at the seat of the difficulty, which turned out to be what this teen-ager thought about himself. He felt that his parents and older brothers were far more gifted than he, and he had come to consider himself dull even though he actually had superior ability. Every mistake he made was self-magnified. He finally had gotten to the point that he would not make any effort in school activities except in two areas where none of his family were participating—music and sports. His peers, meanwhile, responded to him as he invited them to—as a nice, uninteresting "so-so" member of his class. Their response made him feel "out of things" and confirmed his low opinion of his worth.

The boy's abnormally low self-esteem was picked up on a simple scale used by one of his teachers, and when talks began, the nature of the problem became clear. A temporary adjustment was made in assignments, and he was given a moratorium on recitation in class while a tutor helped him with certain deficiencies in his language skills. Various supportive and encouraging efforts on the part of the teacher, plus some counseling from a specialist, began to turn the tide, and gradually normal expectations became possible again. Where failure and accusations of "laziness" had made him worse, it was quite a different story when he was given encouragement, specific needed instruction, and a structuring that temporarily prevented failure and humiliation.

But such handling would not be advisable in every case. Another boy in the same school became a master at the dodge, never finishing any assignments or doing the required tasks. He always had an ingenious excuse for his tardy assignments, his unfinished incompletes, and his forgotten papers. He "got away with it" with talk. When the faculty discussed his case, it was decided to enforce the standards. This took many conferences and temporary exclusion, but he did begin to do what was required. In his case, *more* monitoring was the solution.

These examples show the fallacy of trying to deal with "symptoms" without understanding the reason behind them. The same behavior in two children may spring from very different motivation. A delinquent child may steal because he has no concern for others and no sense of guilt, because his sibling gets the best of things in the family and he just wants to make it even (which his stealing may actually accomplish), because he thinks no one cares what he does and he wants his parents and others to have to show *some* concern for him, or because all the kids he knows do this and he is stealing to prove he is not "chicken."

A child may be "withdrawn" because his dream world is more enticing than reality, because by not entering into relationships he is spared the risk of failure, because he has learned to control adults that way—or for other reasons. By the same token, ten children who see an older brother as more able and more loved than they are may try ten different strategies for coping with this painful situation and we may have ten different types of problem behavior to deal with. There is no one-to-one correlation between symptom and cause in psychological ailments any more than in physiological ones, and limiting treatment to symptoms is equally futile.

Accepting the child and his problem

The term *acceptance* is preached to teachers as the touchstone in work with children, and teachers are reminded frequently that, to be able to help a child they must accept him. Unfortunately, in too many minds the term *acceptance* has come to mean simply being warm, friendly, and loving, as if this alone would be a magic key that would change bad behavior into good.

The acceptance that is needed is far more than this. Accepting a child does not mean just being loving, nor does it mean being passive or permissive. It does not mean condoning misbehavior. Acceptance of a disturbed child and his problem is more likely to mean considerable action and careful planning of strategy. Essentially it means attempting to respond to the child in terms of his psychological make-up—whatever it is. It means accepting the actual nature his past experiences have produced as a starting point and then relating to him in such a way as to help him learn what he needs for more adequate adjustment.

Different problems call for different kinds of structuring by the teacher. Acceptance for the sociopath, for example, means monitoring him and patterning his activities, restricting freedom he cannot use. For the gang delinquent, acceptance of his nature means working through his peer group and peer code toward more socially approved behavior. For a depressed, uncooperative, unhappy child, a teacher may try patient, warm encouragement and mild pressure. For a child who is tyrannizing the class, he may, without rancor, offer the choice between abiding by firm limits and being excluded from the group.

No matter how irritating the actions of a disturbed pupil may be, the teacher must force herself to see through the problem behavior to the child behind it. The child who is least appealing to the teacher's sympathies may be the one who is most in need of them, and the experience of being accepted as a person may do more for him than all the disciplinary actions she can muster.



In each case the teacher is accepting the psychological factors that are at the root of the child's current imperfections and is working to create a situation in which more healthy satisfactions and better self-control can be achieved. In no case does he counter aggression with more aggression or hostility; this would only verify the child's previous experience and intensify the problem. His purpose is to help the child along the road toward maturity, and he can rarely give such help either by being passive or by vindictively seeing that a misbehavior "gets what he deserves."

Examining one's own blocks

Every teacher must examine his own capacity to tolerate, without hostility, pupils who show problem behavior. We differ in what behavior we can accept without letting our good intentions be overwhelmed by contradictory personal reactions. For example, some of us have trouble reaching out to the shy, withdrawn child, who will not respond to our efforts. We feel like giving up. Others have a hard time with pupils who are very aggressive, who lord it over classmates and contest adult authority. Impertinence and impudence make some teachers bristle with counteraggressiveness, so that they can offer no help to the child. Many teachers are sensitive to dirt, to lack of interest in their subject matter, to sexual flaunting, to a child who is so passive that he seems to invite others to push him around.

Most of us have some unfinished emotional business of our own that gets in the way of objectivity in our relationships with our pupils. This may lead us to react in an unprofessional way to satisfy our own needs instead of planning the help the child needs. Thus a clear recognition of our own real feelings is essential. When we have an emotional block and cannot get help to handle our feelings, a given pupil may do better with another teacher if a transfer is possible, just as we may be better able to help a pupil that another teacher has trouble accepting.

Interestingly enough, an intensive study of a child—his potentialities, weaknesses, strengths, motivations, opportunities, and frustrations—often yields an important by-product, a change in the teacher's attitude with a new ability to accept this child. This acceptance, in turn, makes it possible for him to help the child in a way that he could not do at the outset despite the best intentions. There is reason to believe that such changes are quite common. Research has demonstrated, too, that direct consultation of clinical and educational psychologists with teachers can change their potential to deal with children under their care (Morse, 1961).

DEALING WITH PROBLEM BEHAVIOR

Every pupil is a unique personality, but no teacher can respond simultaneously in thirty-five or forty-one or twenty-six different ways. Fortunately, there are certain positive actions and attitudes the teacher can use that "fit" each individual no matter what his special personality is. Many writers have suggested that everyone needs love, confidence in his abilities, opportunities to serve others, and social acceptance. The teacher can take steps to see that these needs receive full attention.

In addition, there are a number of ways in which, even in the regular classroom, he can arrange to give special help to those who need it. Some of these simply help to resolve crisis situations; others serve the longer-range purpose of helping children build the values and skills they need for mature self-direction.

Influence techniques

Each infraction of discipline should not be considered the inevitable product of a deeply disturbed personality. Even the most adequate child will act up at times; marginal children may do so as much as they find the traffic will bear. Such difficulties should be treated for what they are—minor infractions requiring teacher discipline.

There are many "influence techniques" a teacher can apply to change the course of events. Redl and Wattenberg (1959) suggest various techniques that can be applied before the limit is actually reached, but when it looks certain that a child will no longer effectively control his behavior. *Signal interference* is the expression of mild disapproval by word or gesture when the child's attention is secured. *Proximity control* means that the teacher gets close to the scene of the impending problem, sometimes touches the child or sits down next to him in a group, but at least lends support to the child's controls by his presence. *Humor* may also reduce tension and encourage control. And there are times when *ignoring* the child will discourage misconduct. Ignoring is especially useful when the child first looks about to be sure the teacher will notice his actions.⁹

In recent years, with the increased problems in control, there has been a great deal of controversy about the use of corporal punishment in schools.¹⁰ It has been argued that many children experience physical punishment at home and thus expect it, with the implication that this makes it right for the school. But the school is not the home and the teacher is not the parent. Even if physical punishment were a good practice in the home, different intensities of relationship demand different techniques for control. Yet some teachers and school boards have felt that without recourse to such measures school discipline would collapse and chaos would rule. There is a certain desperation in this attitude, and certainly it is no simple problem.

When people say about physical discipline and harsh treatment, "Well, it works," they mean it keeps order. But we should ask just what such treatment produces in children besides outward compliance and whether or not we should take the risks implied in such measures.¹¹

Fundamentally, the recourse to physical punishment connotes a primitive school situation. It is a symptom of a diseased state in the school and perhaps in

⁹The Reading at the end of this chapter is based on Redl's work in this area.

¹⁰The whole issue of the *Phi Delta Kappan*, Vol. 41, No. 3, Dec. 1959, is devoted to the topic of discipline. Dr. Manning's article on "The Good Old Days" reviews especially the problem of physical punishment in schools. Another reference on this topic is "The Legal Status of Corporal Punishment in the Public Schools," by M. V. Jones (*California Journal of Educational Research*, May 1964, 15, 142-149).

¹¹The pros and cons of various types of punishment are discussed in "The Effect of Punishment on Children: A review of the literature and a suggested hypothesis" by Hermine H. Marshall (*Journal of Genetic Psychology*, 1965, 106, 23-33).

the total community. This is not to say that permissiveness is a suitable solution either. Every school needs to develop a clear program for dealing with pupil misbehavior. The school cannot do its job if it cannot keep order. What is needed is a program that attempts to deal with the causes of the trouble and not just the symptoms. Furthermore, the administration and the community must back up the discipline procedures used in the classroom if pupils are to take them seriously.

An effective influence tool, but one to be used sparingly, is exclusion from the classroom. It must be used without hostility and only on the basis of the disruption caused by the pupil in question. While some pupils will be delighted to be sent out, most will not. When a pupil must be excluded, the teacher should then use the situation to talk with the pupil, the principal, and perhaps the parents about what standards must be met if the student is to return. Exclusion without a teacher-controlled process of readmission nets little.

Exclusion should not be practiced to teach the culprit "a lesson," to frighten this child and the others into submission, to prove who is really boss, or to bring down parental wrath on the misbehavior. But in instances of dire necessity, it serves to clarify the standards for the whole class. It enforces the rights of those who *can* learn in the usual way to proceed with their work without needless distraction. Most important, it gives the teacher an opportunity to examine the issue with the offender at a time and in a manner that is impossible while he is directing the classroom group.¹²

Creating a healthy milieu

Even when specialists are available to work intensively with the most disturbed children a few hours a week, the many other hours spent in school each week exert a continuing influence. Unless thought is given to making this influence a supportive and integrative one, the work of the specialists may be in vain. And for the children who have no special help outside the classroom, the milieu established by the teacher and other school personnel may be even more potent in its influence.¹³

A teacher who is aware of the force of this influence can do much to make it a healthy and constructive one—one that fosters maturity. Preventing anxiety-arousing conditions, reducing competitiveness to a level children can manage, and fostering an appreciation of different kinds of contributions all help to give children the feeling of security they need to be able to use their ability, whatever it is, and to reach out beyond the known and the familiar to be kind to others in the class. Showing unsure children that *you* like and believe in them helps them to have more confidence in themselves. Being a member of a class in which they feel liked and trusted makes most children eager to live up to others' good opinion of them. Maximizing success is important too—not outer success alone or success too

¹²For a discussion of this and related problems, see W. C. Morse, "The Mental Hygiene Viewpoint on School Discipline" (*High School Journal*, 1965, 47, 396-401) and "Enhancing the Classroom Teacher's Mental Health Function," Chapter 15 in E. L. Cowen, E. A. Gardner, and M. Zax (Eds.), *Emergent Approaches to Mental Health Problems* (New York: Meredith, 1967).

¹³Redl has emphasized the importance of establishing a consistent, supportive milieu in working with disturbed children; his principles apply as well to the general school setting. See his article "The Concept of the General Therapeutic Milieu" (*American Journal of Orthopsychiatry*, 1959, 29, 721-736).

easily won but a feeling of successful and worth-while achievement. Success in learning is itself highly therapeutic; it can frequently forestall behavior problems or at least be of help in countering them.

An important part of any pupil's environment at school consists of his classmates and their treatment of him. In trying to create a supportive milieu for a difficult child, the teacher may need to help the rest of the group learn to tolerate his deviant behavior and accept the special attention and help he must have. But this tolerance will be possible only if the class as a whole has a good relationship with the teacher. If class members feel undue anxiety or frustration or are fearful of failure, it will be difficult for them to accept the special member; the individual treatment they see him being given may seem to them to be unfair. Only if the teacher accepts his special need, and at the time does everything possible to meet the individual needs of the other pupils, is there a chance for group acceptance to develop.

When the group as a whole has been reacting negatively to the disturbed pupil, as in the case of scapegoating, it may be necessary to impose sanctions. The teacher can calmly and firmly make it clear that proper behavior is expected of everyone. At the same time, however, the teacher must be the protector of the maligned as well as the maligner. In one school, for example, adolescents were teasing and making fun of a classmate who was schizophrenic. His queer mannerisms made him an excellent target, but the teasing, of course, made him more upset and anxious and accentuated behavior that was already too much for his peers. They could not tolerate his ill-concealed masturbation and his occasional shouting out in class. Here the teachers faced the task of reducing his very arousing behavior to a point where his classmates could reasonably be expected to tolerate him.

Changing group attitudes

When the problem behavior is a major condition of the whole group, the teacher may need to work with the whole group rather than with individuals. Few children will adopt values that run counter to those prevailing among their friends, whereas decisions that they themselves reach as a group they will feel impelled to abide by—and safe in following. To be free to change, they also need to feel that the teacher believes in them and is not criticizing them: criticism begets defensiveness and prevents objective self-examination.

Several studies have been made of attempts to help disturbed children in a group setting through an actual study of the dynamics of their own behavior—conscious and unconscious needs and purposes, typical defense mechanisms, and principles of mental hygiene. Findings have been contradictory, but the fact that definite improvement has been brought about in some of the cases suggests that as our understanding and skill increase we may be able to identify the techniques that can make such instruction effective.

In one school situation, a senior high-school class was beset with dissension and conflict. The teacher first tried talks with certain of the obvious perpetrators. But even when they agreed to change their behavior, they were unable to do so; also, it became apparent that they were not the real instigators of the trouble. The

COMPARISON OF THREE KINDS OF INTERVIEWING

Aspect	Depth-analytic	Moralistic	Life space
Instigating condition	Usually a critical turn in long-standing personality problem, with failure to respond to less intense supportive and correctional measures.	Either a crisis situation or a long-term problem. Usually perceived as moral issue by the teacher.	A specific infraction that requires teacher handling or a minor infraction chosen by teacher as having good "teaching" potential.
Goal	Gradual emergence of a more healthy, integrated, independent personality, possibly after temporary period of regression.	Immediate change in character and behavior.	Some degree of immediate compliance with rules on the basis of the requirements of reality, with gradual general improvement through repeated utilization of similar incidents.
Setting	Office "isolation" away from immediate life pressures; a formal setting to which child is brought for treatment.	Classroom or principal's office. Teacher may talk to child in front of class to induce pressure.	Classroom, with privacy for teacher and child or children involved. Presence of an "audience" avoided.
Relationship between child and adult	Close relationship established—the classical "transference," regarded as essential to success in treatment.	Adult authority role exploited; paternalism, with respect demanded.	Empathic: adult identifies with child's point of view, without sanctioning improper behavior.
Content	Conscious attitudes and unconscious fantasy, conflicts, and projections. Focus is on feelings and exploration of impulses through words, play, etc.	Emphasis on moral interpretation of event; discussion of what is right and wrong.	Exploration of what "really happened" with recognition and acceptance of accompanying feelings and impulses as "facts of life."
Processes	Acceptance and interpretation of impulses and feelings, with explanation of symbolic behavior and unconscious processes. Permissive atmosphere encourages child to express and examine his "undesirable" wishes.	Appeal to value system of child, frequently followed by threats, admonitions, and exhortations. Impulses labeled as "bad"; punishment may be administered.	Analysis of each step in the sequence of events, including how it appeared to others, how it appeared to child, and how it infringed on others' rights. Joint exploration of possible ways to prevent or handle future difficulties.
Resolution	Eventual transfer of new insights and attitudes to current life situations, with healthier feelings about self.	Surface compliance demanded. Failure to comply is grounds for exclusion.	Mitigation of critical conditions. Possible restrictions or referrals for further treatment based on requirements of reality, not presented as punishment.

(Based on Dittman and Ketchner, 1959; Dean, 1958; Morse and Small, 1959; Redl, 1959; Wineman, 1959)

teacher reported some of her observations to the whole group, and a few days later she encouraged a class discussion of one specific incident. Later they talked together about the general problem of social relationships. As their awareness and objectivity increased, they began to take responsibility for handling their behavior, but it took much group thought and teacher support.¹⁴

Systematic attention to training both teachers and pupils to analyze behavior in terms of its causes has been given by Ojemann (1961). He has gathered evidence to show that many behavior difficulties can be handled successfully in this way, and he has developed curriculum materials for use with various age levels.¹⁵

Interviewing pupils

A major technique available to any teacher for dealing with problem behavior is the technique of the interview. Talk is no solution in itself but, through talking, the teacher can collect information, try out his judgments of what is wrong and what should be done, develop rapport, and exert influence.

The setting of the interview varies from school to school and from teacher to teacher. In a formal interview the teacher and the pupil sit across a desk from each other in a room by themselves at a time set aside for counseling. Frequently, the teacher must take time from a free period or arrange to stay late after a long and busy day. Perhaps time is snatched between classes or even at the classroom door as students pass in and out. Unfortunately, the teacher often finds it necessary to talk with individual children in the class when other children are around. The latter procedure is most undesirable and should be avoided if at all possible. Interviewing cannot be done without a considerable investment of time, a fact often overlooked in planning the school day.

The purposes of the interview vary widely. Ideally, it is a teaching and a learning experience for both the teacher and the pupil. An interview is an opportunity for student and teacher to inquire together about the student's feelings, attitudes, behavior, and problems, and about their consequences. For success, the student as well as the teacher must be aware of the necessity for talking things over and of the potential value the talk holds. Ideally, the teacher should have gotten to know the pupil well before the difficulty arose, but too often the teacher has no opportunity to talk with a pupil until some problem faces them.

The style of interview advocated here is neither the common moralistic teacher talk, nor the therapeutic interview used by the experts in psychotherapy. Also it avoids the passivity of the nondirective methods so much in vogue today. This new interview design is called "life space interviewing" and is a method developed by Fritz Redl (1959) in connection with his management of disturbed children. It is as technical a method as the better-known ones and requires a certain amount of supervised training, but a simplified summary developed by the author can be presented here. Some of the contrasts between this approach and a moralistic one are pointed up in the chart on p. 432.

¹⁴For a session-by-session account of a similar case in which small-group discussion under teacher direction brought about greater self-understanding and more constructive behavior for adolescent boys see pp. 163-183 in *Psychology in the Classroom* by R. Dreikurs (New York: Harper & Row, 1957).

¹⁵See also Ojemann's "Basic Approaches to Mental Health" (*The Personnel and Guidance Journal*, 1958, 37, 199-206).

the possible solutions to the problem. In efforts to help students develop self-management, teachers must expect that progress will be slow. But gradually it may be possible for the teacher and the child to plan together and work together toward a constructive and realistic solution. Only as the pupil sees for himself the possibilities of solution and feels a willingness to work out the matter can any genuine advances be made. Then planning very specific, short-term "next steps" gives the best chance for tangible success, with the encouragement it brings. Frequent joint evaluation of progress prevents an unwise plan from adding further discouragement and keeps the goal in focus.

When there is no recognition of the need for controls on the part of the pupil, the teacher as an adult must point them out as facts of social living. He may have to resort to the simple statement that "This kind of behavior is unfair to the rest of the class and simply can't go on." Reasons are explained calmly and without hostility but the required behavior and the reasons for it are made clear.

4. *Follow through until the problem is solved* Unless the teacher follows through on his talk with a student, the preceding steps are of little value. The type of follow-through must, of course, be related to the pupil's needs and the requirements of the situation. Help must be given a student who persists in breaking the limits which have been mutually agreed upon. The consequences of continued infraction must be made clear to him. Perhaps the teacher will need to plan extended talks with him about the problem; perhaps he will need to direct the child to a specialist. Restriction of privileges or freedoms may be necessary until the child has more control. Restrictions should always be accompanied by provision for learning the skills which freedom requires. This is where administrative support and strategic exclusion may have to be used.

Special programs

For the very deviant, special programs should be planned to the extent that this is possible. Even for those who must remain in the regular classroom, it is often possible to make special provisions in manner of teaching, in amount and kind of work, in schedule, in amount of supervision and control, and in many other ways. A disturbed pupil may need concrete, brief assignments or a longer time to finish regular assignments. He may need to be told exactly what to do at each step, or he may be made anxious by rigid, exact prescriptions. The teacher who can be flexible about the way goals are met can help children with differing temperaments and potentialities to find satisfaction in school activities.¹⁶

Whether or not it is possible to provide special classes, expectations must be fitted to the special child rather than the other way around. If all he can do at times is draw, this is it. If he writes every paper on "Hot Rods," the teacher accepts this fixation until it can be diverted. If he cannot go to the gym with the others without a fight on the way, the teacher accepts this as a fact, and waits until the halls are clear before letting him go to join his group. Wherever possible the

¹⁶Rudolf Dreikurs has much useful help for the teacher in "Coping with the Child's Problems in the Classroom," Chapter 14 in *Professional School Psychology* by M. G. and G. B. Gottsegen (New York: Grune & Stratton, 1960).

special child should have immediate help as he shows he needs it. The whole grading system may need to be disregarded for a pupil whose work is not on even the normal continuum. How could he really be "graded"? In other words, since his limitations are real and acute, a curriculum must be developed out of him rather than imposed upon him.

For the foreseeable future many children who cannot adjust to the regular classroom will have to remain there anyway. Yet other provisions should be made for them wherever this is possible. Many school systems now have special classes for the mentally retarded, for the very gifted, and for the physically handicapped. Few, as yet, provide the necessary special classes for the brain-injured or the emotionally and socially disturbed. In many communities, however, parents of children who need special schooling are organizing and helping the school to get support for establishing special classes. In some large cities there are now schools devoted to the teaching and treatment of atypical children. In general, special classes have specially trained teachers, small numbers, and a highly flexible program. In such a setting, pupils who have been severe discipline problems often make a reasonable adjustment.

The teacher sees all kinds of children. Some will respond to ordinary amounts of understanding and encouragement or imagination and flexibility in regular classroom arrangements. For others, only a special class, special individual instruction, or the long and deep process of reeducation undertaken by a psychiatrist will help. When the child's problems go beyond the scope of the teacher's ability and training, referral to experts either within the school system or in the community is a wise move. Perhaps the single skill most useful to a teacher is the ability to recognize when a child's problems are too serious to be handled by a classroom teacher.¹⁷

THE TEACHER CANNOT DO IT ALL

The task of helping the immature to become more mature must involve the cooperation of every member of the school staff. An individual teacher has an impossible task unless the faculty, the administration, and the school board work together toward the same goals. A value system cannot be developed piecemeal.

When a principal uses discipline techniques known to have disastrous results or when he sends the problem back with no action whatsoever, the teacher's success will suffer. Basic school policies need to be worked out by the faculty and the administration together so that there are common goals, a common philosophy, and a general consensus about the way specific situations are to be handled. Not only must all school personnel work as a team, but the various aspects of the school program must be coordinated. What good will it do for the athletic program to emphasize fair play if at the same time students feel they must cheat to get good grades or compete with one another for the teacher's favor?

¹⁷For further information concerning the need for special school provisions, you may wish to consult two chapters of *The Education of Exceptional Children and Youth*, edited by W. M. Cruickshank and G. O. Johnson (New York: Prentice-Hall, 1967). See particularly Chapter 12, "The Education of Socially Maladjusted and Emotionally Disturbed Children," by W. C. Morse, and Chapter 5, "The Education of Mentally Retarded Children," by G. O. Johnson. See also *Public Education for Disturbed Children in New York City*, P. H. Berkowitz and E. P. Rothman, Eds. (Columbus, O.: Thomas, 1967).

The team approach includes a community of interest extending beyond the school staff. The recreation programs and group-work activities supported by the community are important. Opportunities for activities away from school can often help students where other methods fail.

Parents and teachers often see children from different points of view. Yet they can talk together profitably when they focus their concern upon the child and not upon a defense for their handling of the child. Too often, the home blames the school and the school blames the home—and the child suffers. The basis for constructive work with parents stems from a willingness to listen, to confer, and to make mutual plans. Sometimes a three-way conference is needed with the student, the teacher, and the parents all taking part.

One of the biggest barriers to productive relationships is the unfavorable setting of many parent-teacher discussions. Most of them take place during a crisis, when the teacher contacts the parents as a last resort. The very nature of such a conference creates defensiveness and uneasiness. The teacher who cultivates relationships with parents throughout the year will not face these hurdles when serious emergencies arise.

In many schools today there are specialists who may be called on as part of the regular school team to give help to children whose difficulties are beyond the scope of the teacher.¹⁸ These individuals differ in function according to the school organization but usually are considered *guidance* workers of one kind or another. Generally they help the student in three areas: selecting courses, choosing and preparing for an occupation, and making personal adjustments. As a rule they are not trained to handle abnormal personality problems but specialize in helping with normal problems. They often are reluctant to help with discipline (Gilbert, 1965).

Specialists in remedial teaching will be of help when behavior deviation stems from inadequacy in basic skills. They can give concentrated instruction at the level of the child's readiness, though often their biggest battle is not against the academic deficiency but against the child's conviction that he cannot learn.

The *school psychologist* may perform a variety of tasks. Basic will be diagnosis of intellectual and emotional conditions. The teacher turns to the psychologist for the specific information which his tests and techniques will produce. Sometimes the psychologist also does individual counseling or therapy, and of late some have been doing group counseling in schools.

Social work is a broad field. Special social workers trained in both social work and education are called *school social workers* or *visiting teachers*. They are of direct assistance when the home situation needs investigation or when some special community service is needed for a pupil. Sometimes economic pressure or medical needs are aggravating the school behavior problems. Social workers are familiar with resources available for assistance. They interpret the home situation to the classroom teacher and often work directly in a counseling relationship with the student.

The *child psychiatrist*, with his medical and psychiatric training, is particularly skilled to work with serious behavior problems of children. While most commu-

¹⁸What should the teacher do and not do? How is a teacher different from a therapist? See *Childhood Problems and the Teacher*, by C. Buhler, F. Smither, and S. Richardson (New York: Holt, Rinehart & Winston, 1952).



The school psychologist is one of the many experts the teacher can turn to for assistance in understanding and helping children with special problems. Individual tests administered by the psychologist often reveal the nature and extent of personality difficulties that group tests given in the classroom setting can only hint at. This girl is telling the psychologist what she "sees" in the inkblots of the Rorschach Test.

nities do not have the services of such a specialist regularly available to the school, his help may often be sought on a consulting basis. When it is possible, referrals are best made to a child-guidance clinic where psychologist, social worker, and psychiatrist work cooperatively with the child and the family.

A promising new approach where the whole community is a blighted one and discipline problems are widespread, is the development of all-day schools.¹⁹ In these schools a clinical team moves into the school to serve the children and their parents. The schools stay open after hours and operate as recreation and community centers for the whole neighborhood. This extension of the school, while not necessary in many instances, illustrates the fact that there can be no solution to difficult situations by halfway procedures. Other schools, as part of a nation-wide effort, are working jointly on school curriculum, behavior problems, neighborhood rehabilitation, and social integration. An example is the Great Cities School Improvement Program of the Detroit Public Schools.

¹⁹For more information about this approach, see "Crisis and Support in Therapy with Children," by J. Rosner (*American Journal of Orthopsychiatry*, 1959, 29, 144-157).

Such special provisions have been helpful where they have been tried. However, they usually do not go far enough, and they are not sufficiently widespread. On the whole, communities and educators have not been very inventive in the use of school settings in the most meaningful way for children who are problem prone. Simply adding specialists to the school staff does not solve all the problems. In the first place, there never are enough specialists to work with all the children who could profit from it or to give them as much time as they need. In the second place, there must be close and frequent communication between the teacher and the specialists if their efforts are to reinforce each other and help the child in a consistent way. Third, even if the child is in treatment, his problems will often persist for a long period and the teacher must expect to keep coping with them in the regular classroom. Even when progress is being made in therapy, there are delays in behavior changes and problems do not disappear overnight. An unwarranted expectation of a quick change in the child often generates ill feeling on both sides. The specialists may need to give the teacher considerable help in handling the child in the daily classroom group situation, especially in the cases where an unhealthy classroom situation has been aggravating the problem or perhaps even caused it in the first place.

One of the encouraging signs in mental health work is what Nicholas Hobbs (1964) has called the "third revolution." The first "revolution" was the change from considering the disturbed as freaks to be seen in a human zoo at Bedlam. The second was the recognition that there are physiological, psychological, and sociological causes of mental illness. The third includes the emphasis on prevention, the use of environmental and curative designs (called milieu treatment and behavior therapy), and the involvement of the nonspecialist such as the teacher. All of this makes the school a more critical agent in the new mental health approach. Since personal and social maladjustment are the nation's number one problem, this role for the teacher is second to none.

Psychologists, psychiatrists, and other experts in the field of human relations do not yet have all the solutions to group and individual behavior problems. The processes of human development and human interaction are not fully understood. You, as a beginning teacher, will certainly not be expected to be adept at handling every disturbance in your class or to be proficient in guiding each student's growing maturity. Even the most skilled teacher-psychologist does not always find solutions or find them easily.

There may be some things you can change very little when the causative factors are beyond your control. The impact of a child's previous unfortunate experiences can rarely, if ever, be eradicated by one teacher in one year. Minor behavior maladjustments can often be modified, but again there will be limits on the rate at which you can move. Responses that have been built up over many years' time and have been periodically reinforced during those years do not disappear overnight, no matter how wise and skilled and understanding the teacher.

You will still need to try many different solutions and to feel free to try others if the first ones do not work. Of course, you will make mistakes. Mistakes taken as opportunities to learn rather than as personal faults to grieve over can be profitable learning experiences for you. Few mistakes on your part will be permanently damaging to your students if your actions and attitudes reflect genuine concern for them.

A DIFFERENTIAL APPROACH TO THE MANAGEMENT OF SURFACE BEHAVIOR OF CHILDREN

One of the facets of classroom discipline that looms largest in the minds of beginning teachers is the problem of handling youngsters whose behavior threatens to become a source of disruption in the classroom. The authors of this selection offer some practical suggestions for determining when the teacher should act and what sort of action is most effective in various types of situations.

If the teacher is going to be successful in handling the multiple behavioral problems that develop in a classroom, he cannot rely on pseudo-psychological solutions. He needs a management model which is based upon a psychodynamic interpretation of human behavior and which will provide him with a differential approach to handling the behavior of children. Fritz Redl's notch scale of handling surface behavior (Redl and Wineman, 1957) was developed to fill this need among practitioners, i.e., child care workers, social workers, occupational therapists, recreational therapists, teachers, nurses, and cottage parents in a residential treatment center for hyper-aggressive boys. Redl states that there are four major alternatives to handling behavior. They are: permitting, tolerating, interfering, and preventive planning. Redl emphasizes that no one of these alternatives is better than any of the others. The task is to find the right combination of techniques for each child.¹

Permitting behavior

Most rules in a school are made to inhibit and regulate the impulsive behavior of children. During the day, they are told in many ways to stop, slow down, and control their behavior. No one would argue against the importance of these rules in a group setting. If it is important for children to know what they cannot do, it is equally as important for children to know what they can do. For example, children should be told that it is permissible to run, shout, and scream on the playground, to be messy when they are fingerpainting, to have some degree of movement within the classroom, to go to the lavatory when necessary, to show some freedom of expression in their creative works, and to express an opposing view without being ridiculed or chastised. Children are reassured when they know in advance that their activities will not meet with adult frowns, shouts, or physical interference. More important, the sanctioning of behavior by adults eliminates much of the children's unnecessary testing of limits. A teacher who permits chil-

¹The organization of this section is taken from Fritz Redl's training notes at the Child Research Branch of the National Institute of Mental Health, Bethesda, Maryland, 1957.

From "The Teacher's Handling of Children in Conflict," by Nicholas J. Long and Ruth G. Newman, *Bulletin of the School of Education, Indiana University*, July 1961, Vol. 37, No. 4. Reprinted by permission.

dren to leave their desks and go to the book corner after they have finished the assignment should make this privilege clear. Then a child does not have to sneak a book and feel guilty about it or feel victorious about squeezing more freedom from the teacher than the child thinks he would expect.

Tolerating behavior

A lot of classroom behavior must be tolerated, but children should have no reason to believe that teachers approve or sanction it. The more common basic assumptions behind tolerating behavior are (1) learner's leeway, (2) behavior that reflects a developmental stage, and (3) behavior that is symptomatic of a disease.

1. *Learner's leeway:* Whenever a child is learning a new concept, experimenting with ideas, or trying to win status in the group, the teacher should expect that the child will make mistakes. He should not expect that the child will do it perfectly. For example, many sensitive teachers tell their class that they are not going to be upset when children err in trying to master new academic and social skills. With some groups, the more mistakes they make, i.e., on an arithmetic assignment, the easier it is for the teacher to help them clarify their misunderstandings. . . .

Sometimes it is helpful to talk about "good mistakes" versus "poor mistakes." A good mistake is made when a wrong answer has come out of some sense, so that the logic shines through the error. A poor mistake is one which rests largely on effort or has not even the semblance of logic.

2. *Behavior that reflects a developmental stage:* Some behavior is age typical and will change as the child becomes more mature. Any attempt on the part of the teacher to alter or inhibit this behavior results in such negligible changes that it usually is not worth the inevitable fight. For example, children in the early grades are impulse-ridden and motor-oriented. Every kindergarten teacher knows this and has accepted the fact that very little can be done about it except tolerate it. This state of tolerance should not be confused with sanctioning it or permitting wild behavior. Another example is that children in the late third or early fourth grade, caught between group pressure and allegiance to the teacher, are notorious for tattling; i.e., "Miss Jones, Johnny hit Mary," or "Johnny pulled a leaf off your flower when you were in the hall." Other illustrations of age-typical behavior are the unscrubbed, unhygienic appearance of the pre-adolescent boy, the primping of sixth-grade girls, the secrets of pre-adolescent girls, and the sex language and behavior of adolescent boys. . . .

3. *Behavior which is symptomatic of an illness:* When a child has a respiratory infection, the chances are that he will cough in class and that the symptom (coughing) will continue until the child is well. This cause and effect relationship is accepted among teachers; however, when a child who is emotionally disturbed shows the symptoms of his illness, such as reoccurring temper tantrums, fights, and irrational fears, the child is likely to be unpopular with his classmates, his teacher, and even with himself. A psychologically oriented teacher realizes that, when a child suffers from emotional problems, the symptoms are rarely conscious forms of meanness but are simply an explainable outlet for his intra-psychic conflicts. . . .

Interfering with behavior

While the psychologically trained teacher is aware of long-range goals and is sensitive to the child's core problems, the teacher still has to handle the spontaneous behavior that occurs in the classroom. Some behavior has to be stopped if the classroom learning is to take place. A child cannot continue to act out all of his feelings. The task is to find ways of interfering with the behavior so that it does not disrupt the group greatly but still may be helpful to the particular child. . . . The following techniques are designed to help a teacher maintain the surface behavior of children over some rough spots. They only are stop-gap methods and do not substitute for a well-designed program or replace the teacher's knowledge of individual and group psychology. . . .

1. Planned ignoring: Much of children's behavior carries its own limited power and will soon exhaust itself if it is not replenished, especially if the behavior is designed to "get the teacher's goat." Assuming that the behavior will not spread to others, it might be wise for the teacher to ignore the behavior and not feed into the child's need for secondary gratification. In the following example, the teacher is aware of the underlying meaning of the boy's behavior.

One technique that I find successful is to ignore disruptive behavior. It works most successfully with Frank. When he starts dropping his pencils, or tapping his feet, I know that it is a signal that I had better get over there in a few minutes and help him. I have found, however, that if I confront him with this behavior, he usually argues with me and causes additional problems.

In this example, the teacher responds to the motivation of the behavior and not to the manifestations of the behavior.

2. Signal interference: Teachers have developed a variety of signals that communicate to the child a feeling of disapproval and control. These non-verbal techniques include such things as eye contact, hand gestures, tapping or snapping fingers, coughing or clearing one's throat, facial frowns, and body postures. Such non-verbal techniques . . . seem to be most effective at the beginning stages of misbehavior.

3. Proximity control: Every teacher knows how effective it is to stand near a child who is having some difficulty. Just as a crying infant will stop crying when he is picked up by his mother, although the actual source of discomfort still exists, the early elementary child usually can control his impulses if he is close to the teacher. The teacher operates as a source of protection, strength, and identification. As one of the teachers explains:

One technique I have found helpful is to walk among the children. As I walk down the rows, I help the children having trouble with their work, or I give the bored ones something else to do. My closeness and help show that I am interested and concerned. It creates a better atmosphere and rapport and diminishes problems. I have found it very helpful and more effective than just standing behind the desk and telling them what to do. When I have a child who needs more than the usual help, I usually put his desk close to mine so that we are both aware of each other. . . .

The advantages of these three techniques, planned ignoring, signal interference, and proximity control, are that they do not embarrass or even identify the child in the group. The teacher may use all three of these techniques while maintaining her classroom program.

4. Interest boosting: If a child's interest is waning and he is showing signs of restlessness, it is sometimes helpful for the teacher to show some genuine interest in the child's classroom assignment, asking whether problem 10 was very hard for him or mentioning his personal interest in athletics, cars, etc. Tapping a child's area of interest may help him mobilize his forces and view the teacher as a person whom he wants to please. One teacher described an experience with a child with whom he used this technique as follows:

Craig was crazy about dinosaurs. He read about them; he drew pictures of them; and he even had a plastic collection of them. As you can guess, Craig was a problem. He did not bother the boys or girls or defy me, but he would spend his class time either daydreaming or else drawing pictures of dinosaurs. I talked to him many times about this and he promised to stop, but the following day he was back at his drawings. I decided that if I could not fight him, perhaps I could join him in his interest. That night I spent the evening reading the Encyclopedia Britannica. The next day I told Craig that I was very interested in dinosaurs, too, and even had a course in college that studied them. Craig was somewhat skeptical of my comment, but after I mentioned some vital statistics about dinosaurs he was impressed that I was an expert in the field. Together we studied dinosaurs but structured the work so that it would only take place after he had completed his regular assignments.

5. Tension decontamination through humor: There is nothing new about this technique. Everyone is aware of how a humorous comment is able to penetrate a tense and anxiety-producing situation. It clears the air and makes everyone feel more comfortable. The example below shows how one teacher used this technique to advantage. . . .

As soon as I entered the room two students who had remained in the room during the playground period informed me that Stella and Mary had a fight in the girls' restroom and were at present being seen by the principal. Since both of these girls are good pupils and are well liked by the class, I imagined that they and the class were wondering what I would do when the two girls returned to the room. Fifteen or 20 minutes elapsed before the girls returned. They entered and took their seats and the room became very quiet. I closed my book, looked at one of the girls and said in a rasping voice of a fight announcer, "And in this corner we have Stella, weighing 78 pounds." Everyone laughed. The tension vanished and we proceeded with our work.

[Here] humor was used to communicate to the class that everything was all right, that there was no need to worry about it, and that the children could relax and return to their lessons.

6. Hurdle lessons: Disturbing behavior is not always the result of some inner problem. Sometimes the child is frustrated by the immediate classroom assignment. He does not understand the teacher's directions or is blocked by the second or third step in a complicated long-division problem. Instead of asking for help and exposing himself to the teacher's wrath for not paying attention or for exhibiting his educational inadequacies, the child is likely to establish contact with his neighbors, find some interesting trinket in his pocket, or draw on his desk. In other words, he is likely to translate his frustrations into motor behavior. The solution is to provide the child with the help he needs before the situation gets to this stage, as was done in the following example.

Sonya was very stubborn and usually persisted in not doing her work. After making an assignment, I would give the students some time to work on it in class. I would walk around the room and casually stop at Sonya's desk. Noting that she had not started, I would ask her some of her ideas and would suggest that she write those thoughts on paper. She could do the work and would do it if I explained it to her and personally got her interested in it. If I let her alone, she would usually sit and begin filing her nails or looking at the boy next to her who would become quite flushed. While this technique meant more work for me, it finally paid off because, as soon as she began working, she worked without assistance and began making passing grades.

7. Restructuring the classroom program: How much can a teacher deviate from his scheduled program and still feel he is meeting his "teaching responsibilities"? Another way of asking this question is, "Does the teacher control the program, or does the program control the teacher?" For example, some teachers feel compelled to follow their class schedule with no "ifs," "ands," or "buts." Otherwise, they feel they cannot hope to complete the assigned course of study. Besides, they feel children must learn not to be affected by every passing emotion. They must learn how to concentrate even under undesirable circumstances. Other teachers voice a different position. They feel that the complexity of life and the many extenuating forces make it impossible to follow a standardized course. The task is not so much to teach children as to provide the conditions under which learning can take place. Perhaps these are straw arguments and the question that needs to be raised is, "Does restructuring a program ever facilitate learning?" "If so, under what conditions?" This takes the task out of the realm of "either-or" arguments and places it in the teacher's ability to predict the tension level of the class in terms of feelings of irritability, boredom, or excitement. If the teacher feels that the class is tense but that the tension is decreasing, he may decide not to redesign his program. However, if he decides that the tension needs to be drained off, i.e., verbalized or channelized, before the class can involve itself in the next assignment, he may change his program immediately. . . .

The children were just returning to the room after the recess period. Most of them were flushed and hot from exercise, and were a little irritable. They were complaining of the heat in the room, and many of them asked permission to get a drink of water as soon as the final recess

bell rang. I felt it would be useless to begin our history study as scheduled. So I told all of the children to lay their heads upon their desks. I asked them to be very silent for one minute and to think of the coolest thing they could imagine during that time. Each child then told the class what he had been thinking. The whole procedure lasted roughly 10 minutes, and I felt that it was time well spent. The history period afterward went smoothly, the atmosphere within the room relaxed, and the children were receptive.

8. Support from routine: We all need structure. Some children need much more than other children before they can feel comfortable and secure. Without these guideposts for behavior, some children become anxious and hyper-active. This is especially true during unstructured times, when children are moved by every wind and breeze of classroom behavior. Most beginning junior high school children find themselves in this state during the first few weeks. One boy summarized his feelings by saying, "It's like one great big surprise. Each hour you go to another teacher and you don't know what's going to happen until it's too late." To help these children, a daily schedule or program should be provided, as this may allay some of their feelings of anxiety. They can predict what is expected of them and prepare themselves for the next activity. . . .

9. Direct appeal: One of the most frequent mistakes of an untrained teacher is that he feels he must intervene severely and drastically in order to demonstrate that he has control of the situation. We know that this is not desirable. Another alternative is to appeal to certain values that the students have internalized. The conflict is that some children have not internalized the same values that the teacher has internalized. For example, a teacher cannot appeal to the child's sense of fairness, if the child feels he has been "gyped" out of something he has a right to possess. A partial list of some of the values that most teachers can appeal to includes: (a) An appeal to the relationship of the teacher with the child, i.e., "You are treating me as if I did something bad to you! Do you think I have been unfair to you?" (b) An appeal to reality consequences, i.e., "If you continue to talk, we will not have time to plan our party," "If you continue with this behavior, these are the things that will probably happen." In other words, the teacher tries to underline cause and effect behavior. (c) An appeal to the child's group code and awareness of peer reaction, i.e., "What do you think the other boys and girls will think of that idea?" or "If you continue to spoil their fun, you can't expect the other boys and girls to like you." (d) An appeal to the teacher's power of authority. Tell the children that as a teacher you cannot allow this behavior to continue and still want to take care of them. The trick is to learn how to say "no" without becoming angry, or how to say "yes" without feeling guilty.

10. Removing seductive objects: Teachers have learned that they cannot compete against such seductive items as a baseball in a group of boys or a picture of the latest crooner in a group of pre-adolescent girls. Either the objects have to be removed or teachers have to accept the disorganized state of the group. It is not entirely the children's fault. Certain objects have a magnetic appeal and elicit a particular kind of behavior from children. For example, if a child has a flashlight, it says "Turn me on"; if he has a ball, it says "Throw me"; if he has a magnifying glass, it says "Reflect the sunlight"; if he has a whistle, it says "Toot me"; if he has

a pea shooter, it says "Shoot me"; and so on. These objects feed into the child's impulse system, making it harder for children to control their behavior. One of the most exasperating experiences in a teacher's lifetime is to set up a science corner only to have it fingered to death in the first five minutes of bell time.

11. Antiseptic bouncing: When a child's behavior has reached a point where the teacher questions whether the child will respond to verbal controls, it is best to ask the child to leave the room for a few minutes—perhaps to get a drink, wash up, or deliver a message. This was done in the following situation.

I had only one occasion to use antiseptic bouncing. One morning during arithmetic study period I became aware of giggling in the back of the room. I looked up to see that Joyce had evidently thought of something hilariously funny. I tried signal interference, and, though she tried to stop, she succeeded only in choking and coughing. By now most of the children around her were aware of the circumstances and were smothering laughter, too. I hurriedly wrote a note to the secretary of the principal's office explaining that Joyce "had the giggles" and asked that she keep her waiting for a reply until she seemed settled down. I asked Joyce if she would mind delivering the message and waiting for an answer. I think she was grateful for the chance to leave the room. When she returned, she appeared to have everything controlled, as had the class, and things proceeded normally.

In antiseptic bouncing there is no intent of punishing the child but simply to protect and help him and/or the group to get over their feelings of anger, disappointment, uncontrollable laughter, hiccups, etc. Unfortunately, many schools do not have a place that would not connote punishment to which the classroom teacher can send a child. To send him to the principal where he sits on the mourner's bench is not very helpful and defeats the purpose of non-punitive management. However, with staff planning, it is amazing what alternatives can be found.

12. Physical restraint: Once in a while a child will lose complete control and threaten to injure himself or others. In such emergencies, the child needs to be restrained physically. He should be held firmly but not roughly. Once again there is no indication of punishment, but only a sincere concern to protect the child from hurting anyone. If a feeling of protection is to be communicated, such techniques as shaking, hitting, or spanking him only make it harder for him to believe that the teacher really wants to help him. . . . The important point to remember is that, whenever a teacher holds a child and is able to control his own personal feelings of anxiety, the chances that his relationship with this child will improve are overwhelmingly in his favor. The child begins to perceive the teacher as a person whom he can trust. Once again, this is very different from physical or corporal punishment.

Preventive planning

The fourth of Redl's four alternatives is preventive planning. Sometimes disruptive behavior can be avoided by developing a better school and classroom pro-

cedure. If a teacher always has difficulty during transitional periods, if there is undue conflict on the playground or in the corridors, the disturbing behavior cannot be attributed solely to "problem children"—perhaps the school program is inadequate. For example, if a teacher bores, fatigues, or regiments children into acting out, their behavior cannot be explained in terms of interconflicts but simply in terms of a poor living design for healthy children. One teacher solved her problem as follows:

In a large elementary school in the heart of Detroit, the staff's major problem during the snowy months was snowballing. Although more teachers were scheduled for playground duty and the severity of the penalty was increased, the problem did not diminish. The children still threw snowballs, but they were much more clever about it. One teacher who was unhappy about additional playground duty suggested that they paint a huge circular target on the back brick wall of the two-story school and actually program more snowballing. After much discussion and apprehension, the idea was presented to the students. They thought it was a wonderful idea, so a student-faculty committee was appointed to draw up some rules and regulations. Once the target was drawn, the problem of snowballing was virtually eliminated. The children threw all their energy into hitting the bull's eye rather than one another. Some children would actually come to school early just so they could have the highest daily score. One teacher commented that many of the "problem children" were very active in this activity and threw themselves out by the time school began. He reported that they were even easier to teach.

Part **5**

THE RESULTS OF LEARNING

*Retaining and Using Learning
Evaluating Learning and Teaching*

RETAINING AND USING LEARNING

In previous chapters we have considered various aspects of the phenomenon of learning. In this chapter we come to what may be the most crucial matter of all. Achieving maturity and being able to cope with the demands of a complicated world requires a fantastic amount of learning. Yet merely "to learn" is not enough. How many times have you felt that you were not learning the things that would really be most useful to you? And how many times have you had the frustrating experience of studying hard and feeling that you had really mastered some topic only to discover later that everything had slipped away except a few hazy impressions?

For example, reflect briefly on your high-school and college years. In this time you have been a student in many different courses. You have studied and mastered—to the apparent satisfaction of your teachers—great amounts of factual detail, generalizations, and techniques. Your achievement has been evaluated by periodic examinations.

How much of all this learning do you think you have retained? How would you like at this moment to take any of the examinations that you took at the end of last semester—for which you perhaps reviewed quite thoroughly at the time? How do you think the score you would get now would compare with the score you received then?¹

To test your retention of something you learned several years ago, try your hand at supplying the names of the capital cities of the following states:

New York	Kansas
Alabama	Nevada
Oregon	South Carolina
Montana	Virginia
Vermont	Florida

¹For a study of retention and forgetting by college students see "The Fundamentals Forgotten by College Students," by G. W. Durfinger (*Journal of Educational Research*, 1956, 49, 571–579).

If you were able to supply all the answers correctly, what do you think has enabled you to retain this learning so well? If you failed to recall some of the capitals, what do you think is the reason for your failure to remember?

Probably you studied plane geometry in high school. Could you lay out and cut the rafters for a house so that the roof would have a given angle of pitch? In other words, you have studied plane geometry—but can you use it? Have you ever used it to solve a practical problem or to understand more fully a theoretical one?

DO STUDENTS RETAIN AND USE SCHOOL LEARNING?

While schools have always had to bear a certain amount of criticism about the effectiveness of their teaching, their critics have been especially articulate since World War II. One of the persistent allegations of these critics has been that the large masses of today's graduates are appallingly deficient in the simple fundamentals—that the schools are not giving them the basic skills they should have.

For example, consider that perennial target of criticism—the teaching of arithmetic. Businessmen frequently report that their young employees—recent graduates of our schools—simply cannot use basic arithmetic processes adequately. Why should this be?

A common explanation for young graduates' lack of competence in arithmetic is that schools have ceased to pay sufficient attention to it. Schools are so busy attending to other aspects of the child's development that there is no time left for arithmetic—or so the story goes.

The explanation has a simplicity that is deceptive, particularly to people who know little or nothing about the program of today's schools. If we could say with confidence that lack of attention and time were the reason, the problem would be simple. All we would need to do would be to ensure through appropriate means that teachers would devote sufficient time to arithmetic.

This explanation, however, will not stand in the light of evidence. Actually, the amount of time devoted to the teaching of arithmetic is between 10 and 15 per cent of total in-session time per week. This is second only to the amount of time allotted to reading in the lower grades and may be more than that devoted to reading in the upper grades (Hill, 1954). The explanation, then, must lie somewhere other than in failure to devote time to instruction in arithmetic.

Another hypothesis is that the trouble lies in the way in which arithmetic is taught and learned. This theory gains credence when we consider that the general public—the source of much of the criticism—does not judge arithmetical competence of graduates on the same basis that the school usually does. The businessman is not interested in whether his employees can manipulate numbers in standard problems as they learned to do in school or even in the score they might obtain on an achievement test. What he wants is for them to demonstrate *ability to use* arithmetic concepts and processes where necessary in connection with their work. If they consistently show inadequacy here, he concludes that the schools must no longer teach arithmetic properly. He may write an indignant letter to the board of education and send a copy of it to the editor of the local paper.

Teachers, of course, resent the allegation that they do not teach arithmetic properly. They point to the amount of time they give to it in the school day and describe the ways they develop new concepts and check on pupil understanding at each step. They describe the testing and other kinds of appraisal they use to measure achievement. They may bring out sheaves of test data to show that their students rank favorably with respect to national norms, present and past. They wonder what more they could be reasonably expected to do.

You can appreciate the feelings of teachers in the face of criticism they consider totally unwarranted. But you may do well to heed the businessman's criticism, for he is using as the criterion for his judgment what is really the acid test of all teaching—the ability of the learner to use what he has learned. In psychology this is called *transfer of training*. The businessman may never have heard of the term, but he has the common-sense conviction that if something has been learned adequately one should be able to use it in various kinds of situations.

Much of what has been said about arithmetic could also be said about spelling, reading, and grammar. These are cultural tools of great importance in the ordinary affairs of life. The person who is incompetent in them in life situations is handicapped—no matter how good his grades in school were. And employers *do* frequently criticize young people for poor spelling and for inability to express ideas clearly and grammatically.

What about other things the schools teach? What about history and other social sciences? Or the fine arts? Or the sciences? Are you a better person for having taken courses in these subjects? Do they really make a difference in your competence to meet life problems? If so, what kind of difference? Such questions must be asked, for if you cannot have some confidence that learning these subjects has made a difference in your present understanding and competence, then how can you justify having schools?

In all fairness to teachers, it should be recognized that often there are subtle factors at work to deter them from concentrating on retention and use of what they teach. One such factor is the pressure on them to bring their classes up to the norm of performance established for their grade level. They are not required to demonstrate that pupils will retain and use what they have studied but only that they have “mastered” it to the desired degree. Since teachers' own professional advancement may depend on their pupils' meeting the grade norm requirement, their teaching is likely to be tailored to mastery rather than to retention or use—to the kind of evaluation they know will be made.

Another subtle pressure puts a premium on short-term results. The tradition is for learners to go from unit to unit, from course to course, from teacher to teacher with a test at the end of each interval but no follow-up testing to see what is carried over. After a class has gone on, a teacher usually has no way of finding out whether his students have retained and used what he taught them—except sometimes in a very general way. Since he has no way of checking on his success in these long-term objectives, and since he himself is rated only on the short term results he gets, his interest may not extend to retention and future application.

Departmentalization and specialization complicate these problems further. A history teacher may not even know what his students are studying in literature or science that might be related to the concepts he is teaching. So it is natural for him

to use the brief segments of time students are with him to develop historical knowledge and concepts and check on students' mastery of them. How these concepts are worked into the students' broader framework of knowledge or whether they are transferred to other courses is left to chance.

The formal setting of the schoolroom itself is a block to transfer, and many pupils regard school learning as something quite apart from life—something to be dismissed from one's mind as one leaves the school building. Teachers cannot follow youngsters home from school and show them how to use in their activities at home what they have been learning at school. Some teachers try to get students to think about such applications while they are in school; others do not bother.

Sometimes the relation between school learning and home activities is missed because teachers are overconcerned with planning logical organization of the school learning in keeping with the sequence and continuity demanded in an established course of study. When teachers must "cover" certain material, it is easy to forget that its utility will depend as much on the bridges they build between it and the learners' other experiences as on the great truths in the material itself.

The remedy commonly advocated for producing graduates who will show more competence in their use of intellectual tools is well known. It is simply to "get back to the fundamentals and a really rigorous program of teaching. The school must stop frittering away children's time in frills." The reasoning is that if this can be done the problem of retention and transfer of learning will in large measure disappear.

Once again, the simplicity of the solution is deceptive. What is being advocated in such proposals is to have more of the same thing that already seems to have proved itself ineffective. And actually, in the opinion of many investigators, numerous studies have shown that today's students already do better on achievement tests than students of past generations.²

The crux of the matter is that the passing of tests in school does not seem to ensure that material will either be kept or be used outside the classroom. Perhaps a more promising approach will be for us to consider what research shows us specifically about the conditions that promote or interfere with efficient retention and use of learning.³

RETAINING LEARNING

The retention of learning is a topic in which psychologists have been interested for a long time. But because laboratory studies of retention, as explained in Chapter 6, have typically involved material learned by verbatim memorization—and often nonsense material at that—you can expect to find some differences between the laboratory findings on retention and the retaining of principles and generalizations developed in a meaningful context. For example, in a check on how much

²A summary of some of the facts in this regard appears in "We Can Be Proud of the Facts," by H. G. Shane (*The Nation's Schools*, 1957, 60, 44-47).

³A valuable discussion of psychological principles involved in retention and transfer of learning will be found in *The Psychology of Learning* (3rd. ed.) by James Deese and Stewart H. Hulse (New York: McGraw-Hill, 1966).

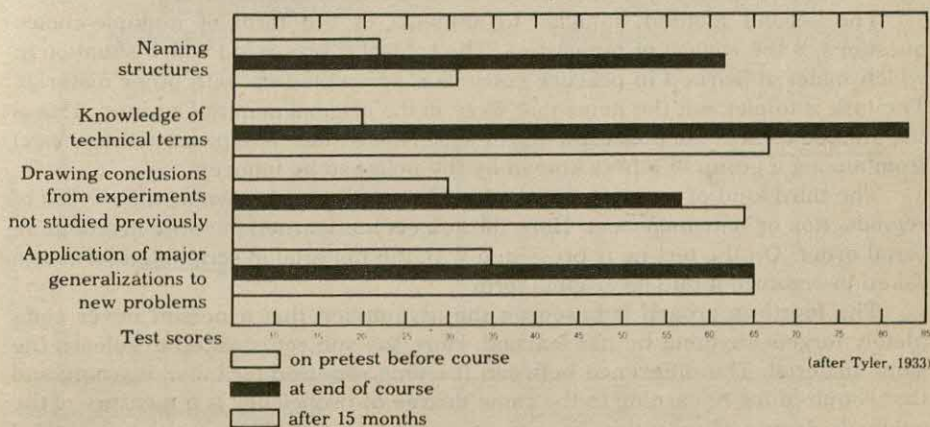
knowledge of zoology a class had retained fifteen months after completing the course, it was found that although their average score on a test of naming structures had declined to just half of what it had been at the end of the course, they actually showed an improved ability to draw conclusions from experiments they had not studied and there was no loss in their ability to solve new problems (Tyler, 1933). Other studies have had similar findings (McDougall, 1958). Although a large proportion of specific facts may be lost, general principles and the ability to apply them may show only slight loss or no loss at all.

Measuring retention

In a typical laboratory experiment in retention, the subjects participating are asked to master a certain learning task. The task may be motor or verbal or may combine elements of both. At some point after the learning sessions have ended, the experimenter measures the amount of learned material that the subjects have retained. In some experiments the measurement is made as soon as the "learning period" is over. In other cases the interval between learning and testing is longer—perhaps several days or even several weeks.

In a general way, this pattern is not greatly different from what most teachers do. In the classroom it is customary to conduct a series of learning sessions on some organized body of material. At the end of a given time, the teacher prepares a test to "measure the amount students have learned." This measure most often occurs at the end of the unit or course; thus the retention interval is very short

DIFFERENTIAL RETENTION OF LEARNING IN ZOOLOGY



Because knowledge of facts is easier to test than understanding of principles and skill in using them, achievement tests often stress memory at the expense of other equally important objectives. Yet of all the possible end products of learning, knowledge of specific facts seems to be the most transient. The graph above, showing retention of learning from a zoology course, suggests that for high returns in long-term retention, considerable instruction time should be spent giving students guidance in activities like drawing conclusions from evidence, looking for relationships, and examining the implications of a principle for many situations—in other words evaluating, translating, applying, and interpreting rather than memorizing.

—only a few hours if the student crams for the examination he knows is coming. Except perhaps for certain kinds of standard achievement testing, the school seldom extends its measurement to longer intervals. Thus, as we have noted, the teacher can have no very clear idea of the long-term effects of his teaching.

There are four common methods of measuring retention. The first, used by both psychologists and teachers, is the *method of recall*. Here, as the name suggests, the learner must recall—recreate from memory—what has been learned. In a laboratory experiment, the learner must usually produce the material verbatim. Any deviation is recorded as an error. In the classroom the same situation may obtain. There is only one possible right answer to the question, “When was the Battle of Hastings?” Usually, however, the teacher is interested in pupils’ understanding of an idea and ability to apply it, as well as simply in their ability to recall it. Thus, he may encourage originality of interpretation and expression rather than verbatim recall. As you have seen, when teachers ask only for verbatim recall of “right answers” they encourage memorization without thought. This is the situation in which pupils learn to recite, “The interior of the globe is in a state of igneous fusion,” with no understanding of what they are saying and hence no ability to use the material.

When verbatim material is being tested, the subject consistently gets a lower score with the method of recall than he does with other types of measurement. This could be interpreted to mean that the recall method is a truly rigorous one, ensuring high standards. What it actually shows, many psychologists say, is that the recall method is relatively insensitive as a test of what has been retained. In other words, people actually remember more than recall indicates. For example, in learning a foreign language, a student can usually recognize more words than he can yet recall and use in his own speech. For this reason and others, psychologists have devised other kinds of tests to measure retention.

The second method, familiar to students in the form of multiple-choice questions, is the *method of recognition*. The subject is presented with a situation in which material learned in practice sessions is scrambled up with other material. The task is to pick out the items that were in the original material learned. This is the method used in the police line-up, in which the witness is to pick out the suspect from among a group of others known by the police to be innocent.

The third kind of measurement, somewhat similar, is known as the *method of reproduction or rearrangement*. Here the subject has learned material in a definite serial order. On the test he is presented with the material in scrambled form and asked to organize it into its original form.

The fourth approach is based on the assumption that a person never completely forgets anything he has learned. Here the subject is asked to relearn the same material. The difference between the time required for initial learning and that required for relearning to the same degree of proficiency is a measure of the subject’s degree of retention from the original learning. This is generally called the *method of relearning* or the *method of savings*.

All four of these are methods of measurement commonly used in laboratory studies. Only the first two are used with frequency in the classroom. Essay-type examinations and completion questions employ the first method; objective examinations—except for some types of fill-in items—employ the second or, rarely, the third.

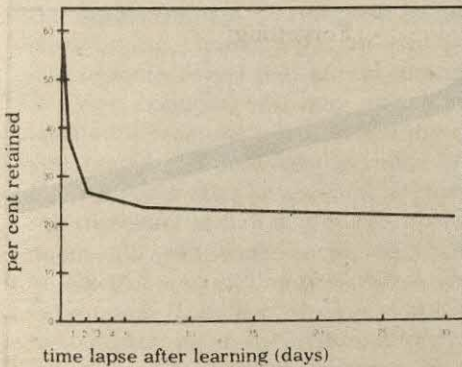
Probably the most striking thing revealed by studies of retention is that the amount retained begins to decline almost as soon as the learning activity ends. The greatest amount is lost in the first few hours; in fact, as much as half of the material learned may be lost in the first twenty-four hours. When retention is measured over a substantial period of time, it is found that the decline continues but at a less rapid rate. The curves below show both the rapid loss at the beginning and the more gradual loss later on. The first was obtained with nonsense material in the laboratory; the second curve was obtained with facts in a fifth-grade geography unit on the West Indies. In both cases retention of specific items was being tested.

The rapid early loss of material learned is illustrated by a common experience of students: they review thoroughly for an examination and write a satisfactory or even good examination paper. Then perhaps only a week or so later they are amazed to find how little they remember of the material.

Under certain circumstances, however, retention is found to be actually better after a short interval of time than it was immediately after the learning activity. This phenomenon is called *reminiscence*. It has been described in detail and has been found to occur both in learning experiments in laboratories and in school situations. However, it has been difficult to formulate an explanation for it.

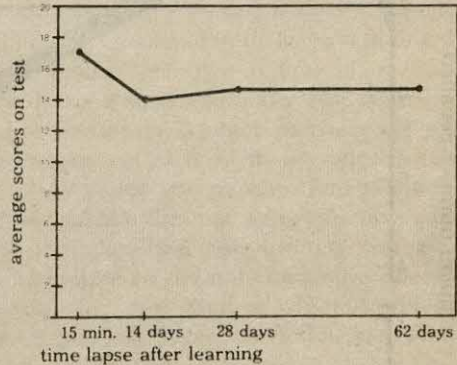
One idea which has been advanced is that at least in meaningful learning a person may "keep practicing" after the learning period is over. The learned material is recalled, worked over, and consolidated—not in formal studying but incidentally as we are doing other things. Such a process could help explain why some important principles remain with us for a long time and may even gain strength over a period of years. It does not seem to explain very well, however,

RETENTION OF
NONSENSE MATERIAL



(after Ebbinghaus, 1913)

RETENTION OF
MEANINGFUL MATERIAL



(after Tiedeman, 1948)

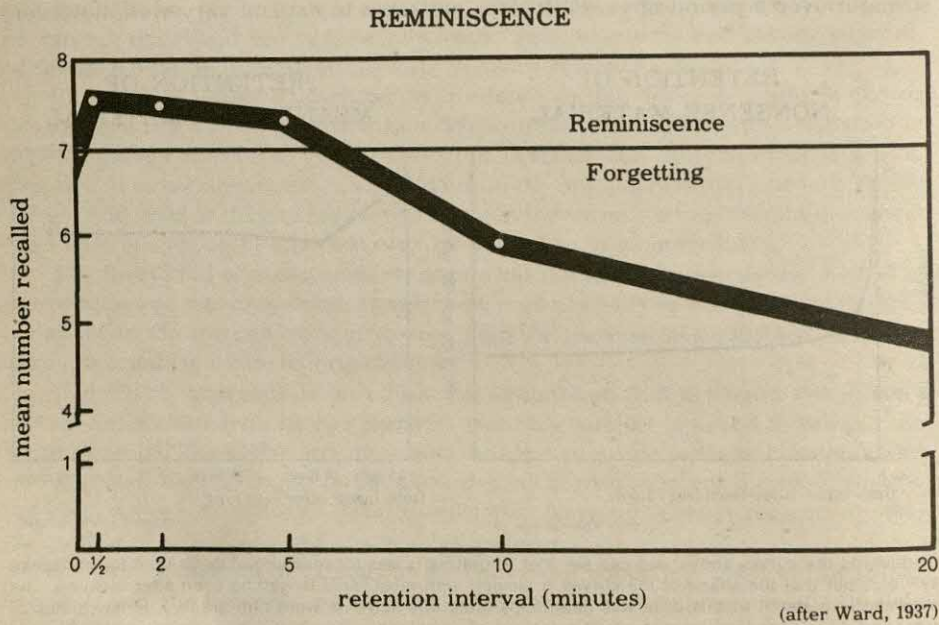
Comparing the curves above, you can see that forgetting is less for meaningful items than for nonsense syllables but that the shape of the curves is similar, with most rapid forgetting soon after learning. The meaningful material in this case was geography facts; the subjects were fifth-graders. Most studies of retention, like these two, have involved measures of knowledge—how many items once mastered could be recalled at some later date. The findings in the Tyler study described earlier suggest that curves of forgetting for other kinds of learning, such as general principles and the ability to apply them, would probably show quite different shapes.

why the effects of reminiscence also appear in certain kinds of laboratory experiments with nonsense material. It most certainly does not seem to explain adequately the appearance of the phenomenon in the case of rats trained to run a maze. Presumably rats are not capable of conscious review and consolidation. In any case, where reminiscence has occurred, the improvement after learning activity has ceased has been slight and short-lived, and the usual forgetting curve has been found thereafter.

How we remember

If psychologists could develop a general theory to account for all phenomena of memory, it would obviously be a great step in the development of the theoretical structure of psychology. Teachers would also reap practical benefits from such an achievement because it would be possible to develop teaching methods in harmony with the way memory actually functions. There have been various attempts to formulate such a theory but none of those put forward has yet gained universal acceptance.

It may well be that science is now on the verge of a spectacular breakthrough in understanding the basic neurological and physiological processes involved in learning and memory processes. Basic research in various laboratories around the country suggests that the key to learning and memory may lie in the ribonucleic acid (usually called RNA) in the brain cells. A considerable amount of work in this



Reminiscence is a puzzling phenomenon that has not been satisfactorily explained, especially in cases where it occurs with animal subjects. In any case, it is short-lived, and the usual forgetting pattern soon commences.

area has already been done with animals and some experimenters are now turning to human subjects. Predictions are being made that once the basic chemical processes are understood, it will be possible to enhance (or inhibit) memory by chemical means.

At the present time, of course, all this is occurring on the frontiers of biology and biological psychology—which means that it is a long way from being applicable in the psychology of education. Nevertheless, it is more than possible that sometime in the future teachers can expect to have a much more thorough understanding of the neurological processes involved in storing information.

In the meantime, let us examine some hypotheses about remembering that have been derived from studies of learning behavior.

1. Remembering as reconstructing A hypothesis that has been advanced in explanation of retention is that remembering, like learning, involves elements that are dynamic and, in a sense, creative (Bartlett, 1932). According to this view, recall is something more than the simple reactivation of the original response on cue. For example, McGaugh (1966) has observed, "As far as behavior is concerned, memory is not only the capacity to repeat, it is the capacity to vary" (p. 1351).

In the reconstruction theory of memory, the hypothesis is made that following learning the nervous system retains what may be denoted as "memory traces" and the learner, in his effort to remember, tries to reconstruct from these traces the entire concept or response as he learned it originally. Recent research indicates that a memory trace is not permanently established as soon as the experience is over. Apparently, some kind of short-term or temporary process is the basis for immediate recall, while the establishment of long-term traces is a process that takes longer, perhaps several hours (McGaugh, 1966).

There is some evidence, even from ordinary personal experience, that supports the reconstructive theory of memory. If remembering is actually a process of re-creating, then what we do is try to reconstruct from memory traces the entire concept or response as learned originally. Since memory traces may often be incomplete, a person tries to fill in the missing details in such a way that his response seems logical and complete to him.

For example, you may at one time have memorized a favorite poem. You learned it well enough to retain the major portion of it intact and over the years you may have occasionally recited the poem, or parts of it, to yourself. Then several years after your initial learning of the poem, you perhaps had occasion to see the exact text of it. You felt reasonably certain that you still remembered the poem. So you were surprised to find that you had unknowingly changed a number of words. The new words you had supplied did not change the meaning very much, but they were not the words the poet used. Each time you had recalled the poem by reciting it to yourself, you had reconstructed it, improvising when the memory traces were inadequate, without realizing it.

2. Remembering as purposeful We often change remembered material not only to make it simpler and more logical but also to make it accord better with our feelings and attitudes and enhance our self-picture. We remember things the way we think they ought to be instead of the way we originally experienced them. Often we look back with nostalgia on an essentially happy period of our lives, forgetting all the irritations and frustrations we were also experiencing at the time.

Not only do our feelings and attitudes cause changes and distortions in the material we remember; they also seem to render some things easier to remember than others. We often forget the errand we do not want to do or the appointment we do not want to keep. A number of studies have found that subjects learn better and remember better the material that agreed with their point of view.

Jones and Kohler (1958) found that learners with strong prosegregationist leanings learned plausible prosegregation and implausible antisegregation statements more easily than they learned plausible antisegregation and implausible prosegregation statements. With subjects who had strong antisegregation attitudes, exactly the reverse was true. Less clear-cut results were obtained by Garber (1955). He compared the retention of information about Russia by persons holding favorable attitudes toward Russia with retention by persons holding unfavorable attitudes. In his study, favorable attitudes enhanced remembrance only slightly and unfavorable attitudes apparently had no significant effect.

In any case, there is considerable evidence that feelings and convictions do often affect what we remember. We seem to be as subject to wishful remembering as we are to wishful thinking. Both phenomena are evidently examples of a broad process through which, in learning, judging, thinking, and all our experience we try to maintain and build further the self-structure and frame of reference that we have already developed. In this attempt we may select and magnify the stimuli that support our picture and may screen out or distort the elements that are either irrelevant or threatening to it.

For example, Levinger and Clark (1961) showed in a carefully controlled laboratory experiment with word associations that more responses to words having emotional tone are forgotten than are responses to words that are neutral in tone. It should be understood, of course, that a given word may have an emotional tone for some people and not for others, depending on differences in experiential background.

Why we forget

Another way of looking at the problem of retention is to consider the question of why we forget.

1. *Disuse* A common-sense answer to this question is that disuse accounts for forgetting. Many things learned in school have no utility for the learner with the result that he never employs them or thinks of them after he leaves the classroom. It seems logical to suppose that unused learnings fade away in much the same way that an unused muscle atrophies.

2. *Interference* Although frequent use of learned material is known to help retain it, retention evidently occurs for reasons other than as the effect of simple practice and in many cases forgetting is clearly not simply a fading out. Most research today proceeds on the presumption that forgetting is caused largely by interference from other experiences and from competing learnings. This competition among ideas apparently leads to the strengthening and dominance of some and the figurative pushing aside of others.

Interference between old and new learning may work in either direction or both. Suppose that a class in English literature studies *Twelfth Night* and then *Measure for Measure*. One of the teacher's objectives is to make sure that his students can identify the major characters in both plays. Accordingly, the students first practice recalling the names of the important characters in *Twelfth Night* and identifying their roles in the play. Then, when the class turns to *Measure for Measure*, the teacher again insists on attention to the identification of the important characters. At the end of the unit a major examination is given and stress is laid on ability to identify and describe characters in both plays.

In taking the examination, many students find themselves confused. They are not sure any more whether a certain character belongs in one play or the other. They try to make their responses logical. They try to "figure out" in terms of what they know about the plots which character goes where. For some students, the more they "figure" the more confused they become. This may happen to the good students as well as to the poor ones. It is not altogether a consequence of insufficient study, nor is it a consequence of failure to understand the plots and action of the two plays. Instead, two kinds of interference are at work.

In the first place, the recall of *Twelfth Night*, which was learned first, is inhibited by memories of *Measure for Measure* which was learned subsequently: when the student attempts to recall characters from the first play, those from the second insert themselves. This is called *retroactive inhibition*, meaning "backward-working inhibition": what is learned in the second task interferes with the retention of what was learned in the first.

But the students also find characters from the first play interfering with their memory of those in the second. This is called *proactive inhibition*—"forward-working inhibition."

Since in complex situations it is not always easy to tell whether interference is retroactive or proactive, psychologists often prefer to think of inhibitory interference as *interactive*. In the example of the English class studying Shakespearean plays, both proactive and retroactive inhibition are involved; this is therefore a case of interactive interference.

In a laboratory study of interference, investigators sought to determine whether subjects who were shielded as much as possible from experience that might interfere with retention of meaningful verbal material would retain more than a control group whose members were not shielded (Grissom, Suedfeld, and Vernon, 1962). After being confined in dark, soundproof, individual chambers for one minute, subjects heard a passage from Tolstoy's *War and Peace*. They were instructed to listen carefully because they would be required to repeat the passage. As soon as presentation of the passage was completed, the subjects were directed to repeat the story as nearly as possible in the original words.

When they finished, members of the control group were released and told to go about their usual affairs but to report back in twenty-four hours. Members of the experimental group remained in their darkened rooms for twenty-four hours, lying as still as possible. At the end of the twenty-four-hour period, all subjects were directed to repeat the passage.

The results showed that retention of the passage by members of the experimental group did not change significantly during the twenty-four-hour interval. In the case of the control group, however, there was a significant decrease in

retention. Evidently, the loss in the control group was the result of intervening experience that provided interference. Members of the experimental group, whose range of experience was cut to a minimum by their confinement, were not subject to any marked degree of interference, even though one might have speculated at the outset that the conditions of extreme deprivation might themselves have proved traumatic enough to affect retention.

This study provides a striking demonstration of the effect of competing experience on retention. However, the findings are not directly applicable to educational situations since it would be impossible, as well as undesirable, to shield students from competing experience as was done in the laboratory experiment.

At any rate, there is considerable evidence to substantiate the concept of interference as a major cause of forgetting. Studies of interference have shown that (1) interference in learning increases as the number of competing associations increase; (2) interference is greater the more similar the material in the two learning tasks; and (3) the more incomplete the learning, the more it suffers from interference by material learned before or after it; conversely, the better it is learned, the more resistant it will be to interference.

It should be remembered, however, that most of the evidence comes from laboratory-type experimentation rather than from classroom experience. The two types of situations and the kinds of material learned in them are sufficiently different to warrant caution in generalizing too freely. That somewhat different factors may be important in the classroom is suggested by a study by Hall (1955). Using meaningful material instead of the nonsense syllables or paired words often used in the laboratory experiments, Hall had three groups of subjects learn the same material. The first group was then taught material unlike the initial material. The second group was taught material similar to the initial material. The third, or control, group was not taught any new material. When all subjects were tested for recall three weeks later, no significant differences were found. This suggests that when recall is measured *after a substantial period of time* the effects of the inhibition caused by a particular bit of interpolated material may not be very significant. After all, in twenty-one days all the subjects undoubtedly encountered much material that could have interfered with what they had learned at the beginning of the experiment. Thus the interference caused by the interpolated material in the experiment became indistinguishable from the interference caused by all other sources.

Although there is no conclusive evidence as to the part interference plays in the retention of school learning, many educational psychologists believe it is a good idea for teachers not to present in close sequence bodies of material so similar that students may confuse them—unless for the specific purpose of clarifying similarities and differences. To take up beginning German and beginning Russian the same semester, for example, would be likely to result in considerable confusion. On the other hand, as already suggested, a fair mastery of one before the other is attempted would be a good safeguard against interference. The more thoroughly a student has mastered one set of responses, the better able he is to differentiate it from responses learned subsequently.

3. Repression Another account of the phenomenon of forgetting takes its cue from Freudian principles. Freudian theory states that material that is unpleasant

and anxiety-producing to the learner may be forced below the level of consciousness. It is postulated that the learning does not disappear from the learner's nervous system, but that certain psychic mechanisms are at work to suppress the disturbing material sufficiently to keep it out of his awareness. In this sense he seems to "forget" only because the material is not available for voluntary recall. Under hypnosis he may recall every detail, indicating that he has not *really* forgotten at all. Those who follow psychoanalytic theory hold that repression is essentially an adaptive reaction in which the individual unconsciously seeks protection from unfriendly or self-devaluating thoughts and impulses.

Both clinical and experimental evidence support the concept of repression as an effective cause of "forgetting" in some cases (McGinnies, 1949; Williams, 1951). Yet in general, psychologists do not regard it as the major cause of most forgetting, particularly in the case of typical material learned in school. About all we can say at the present time is that repression appears to be but one of the causes of forgetting.

Apparently, forgetting must be thought of as an active, dynamic process. Both the interference and the repression theories emphasize that it is not simply a passive fading away of responses. Certainly the "disuse" explanation is patently inadequate to explain the process of forgetting.

Teaching for good retention

Out of all this, the important thing for educational psychology is what the teacher can do to improve retention of material learned in school. What practical suggestions for teaching emerge from the vast amount of research on memory?

1. Fostering efficient techniques of learning One way teachers can help students retain what they learn is to help them develop good ways of going about their study and practice. Some of the poorest study techniques grow out of the presumption that learning means memorizing and nothing more. To a great many people "studying" means committing to memory—as nearly verbatim as possible—what is contained in the textbook or the lecture notes. Unfortunately, some teachers seem to teach on the same presumption. They "lay out the work," they conduct recitations and drill on the material, then they give a test which almost every student can recognize as a test of rote memory. In some cases students are actually penalized for injecting their own thoughts and interpretations. So in self-protection they learn to give the teacher what he wants—just what he gave them.

You have already seen how inefficient and futile most such learning is. Material kept isolated in this way has no moorings and is likely to be lost as soon as the course is over because it meets no continuing need of the student.

The general factors that promote thorough learning also tend to promote long-term retention. Considerable attention has been given to these factors in Chapters 7 and 8. Efficient studying involves defining, organizing, comparing, analyzing, questioning, interpreting, and evaluating—searching actively for meanings and relationships. Such studying is active and creative, and what one learns in the process becomes truly his own. The teacher who can induce this kind of studying in his students need not worry that they will forget the newly learned concepts when the exam is over.

2. *Building intent to remember* Studies have shown consistently that learning and remembering are both aided if the learner has a conscious intent to remember what he is experiencing. Whether his reason for wanting to remember is to keep peace with the teacher, to show off his superiority, to find the answer to a puzzling problem, or to master skills that he expects to need later, his desire to remember is an important factor in mobilizing the attention and effort needed for good learning and long-term retention. Of course teachers feel that some reasons for wanting to learn are better than others. A reason like seeing a use for new material, for example, probably pays better long-term dividends than a reason like wanting to display one's superiority, because the latter would be less likely to lead to depth of understanding or to a firm consolidation of the new learning with previous learning.

The effect of anticipating a definite use for material being learned is shown in a study by Jones and Aneshansel (1956). In this study two groups were formed—one of subjects who strongly favored racial segregation and the other of subjects who were strongly opposed to segregation. All the subjects were asked to learn a series of antisegregation statements. One half of each group were simply asked to learn the statements with no reason being given. The other half were told that these statements would be useful as arguments in a debate which would be a later part of the experiment.

It was found that the subjects who anticipated a future use for the material performed at a higher level than those who saw no such purpose—even when they were learning material contrary to their own beliefs. In fact, the learning and recall of antisegregation material by the prosegregationists who saw a purpose in learning was superior to that of the antisegregationists who were learning material in agreement with their beliefs but who did not anticipate any use for their learning. What made the difference was the presence or absence of a *purpose for learning*—in this case the expectation of use for what was being learned.

There is ample evidence to show that intent to remember is a genuine motivating factor, but Ausubel and others (1957) found that this is not the case when the set is established *after* the material has been learned. Two groups were given a passage to study and told that they would be tested on it immediately afterwards. Following the learning activity and the test, one of the groups was told that they would be retested in two weeks; the other group was not warned of the retest. When both groups were tested two weeks later, they showed no significant difference in retention. Apparently, if intent to remember is to be a significant factor in retention, the learners should be told *before* they begin to learn that they will be retested in the future. Teachers will do well to take note of this. So often after a unit of learning is over the teacher will exhort his students to remember what they have learned because it will be useful to them later on. Ausubel's study indicates the general futility of such exhortation.

As you have seen, new material is immediately seen as useful when it answers a puzzling question or solves a problem. To make the best use of such *intrinsic* motivation (motivation inherent in the task itself) a teacher involves students in the problem or question and then guides them as they try to discover, define, and formulate the answer. Simply giving them the same information to learn without the context of the problem provides no such motivation. With this

procedure, other reasons for learning, such as grades, parental opinion, college entrance, or promises of future utility must be used. When, as in these cases, the motivation is *extrinsic* to the learning task, the learning brings satisfaction only indirectly by meeting some *other* need of the learner. The whole thorny problem of how to get students to want to learn in school was discussed in Chapter 10.

3. Making sure that material has meaning One point of agreement among psychologists and teachers is that seeing meaning in material to be learned aids learning and retention. You have already seen that nonsense syllables are quickly forgotten. Schools are usually not thought of as places in which nonsense material is taught, yet material memorized without understanding is nonsense material as far as the learner is concerned. Chapter 7 discussed the problem of empty verbalism in teaching and the dependence of meaning on each individual's past experience.

In selecting and organizing material, therefore, the teacher needs to be very sure that it will have meaning for those who are expected to learn it. Whatever intrinsic pattern it has can be accentuated by special attention to important figures and internal relationships. Yet as you have seen, internal organization alone, no matter how logical, can never invest material with meaning for a person whose background of relevant experience is too limited. Any efforts a teacher makes to enhance the meaning *the learners see* in what is to be learned will pay rich dividends. There will be a higher level of original mastery, a better "anchoring" of the new material, and greater resistance to interference from other learning.

4. Continuing teaching beyond initial mastery In schoolwork both student and teacher are usually satisfied with good performance on one test. Learning is continued only until students reach this point; then the class proceeds to study something else. Yet much material learned only to this level of proficiency is apt to be lost quickly; without further practice the amount retained even a few days later may be low. But if practice is continued well beyond the point of mastery, learning can be so thorough that much less is lost. This is called *overlearning*.⁴

The multiplication tables are an example of material typically overlearned in school. Although these tables are not taught as they were fifty years ago, practice on the different combinations still usually extends over several grade levels, and the total amount of practice devoted to them is enormous. As a result of this high degree of overlearning (plus, of course, some continued functional use of the material) you probably know the multiplication tables today about as well as you ever did, and it is unlikely that you will ever forget them.

Psychologists assure us that if everything taught in school could be overlearned to the same degree that the multiplication tables are, retention would not be so great a problem (T. F. Gilbert, 1957; Postman, 1962). This, of course, is neither possible nor desirable, particularly in view of the enormous amount of material students are expected to cover. Even though a high degree of overlearning may

⁴The role of repetition in retention of material learned is discussed in "Repetition and Learning" by I. Rock (*Scientific American*, 1958, 199 (2), 68-72).

be the best insurance against excessive interference, it simply cannot be accomplished for most material under present conditions.

This suggests that our present curricula need to be scrutinized carefully. Some educational psychologists have been saying for a long time that the present conceptual load is too great to make thorough mastery possible (see p. 231). Teachers try to do so much that students often wind up with a "mental hash" of half-understood, incompletely learned fragments.

Overall change in curriculum proceeds slowly, but in the meantime teachers may improve the quality of learning in their own classrooms if they will select the facts, concepts, and generalizations that are of the greatest importance and concentrate on them. They cannot, and probably should not, try to attain the kind of saturation point represented by the multiplication tables, but they can ensure a more thorough mastery of really important material than at present prevails.

5. Providing for review Well-organized reviews following learning help to retain what has been learned. Even more effective than straight review "in a vacuum" is the review that comes through continued use of the material, particularly when it is being applied in novel situations so that its meaning and evident usefulness are being extended (Davis and Rood, 1947). This is one of the strengths of the problem-solving approach to teaching: if well planned, it can enable the student to keep applying in new situations material he has already acquired. Such usage not only provides for practice and hence improved mastery of the material, but it also widens the meaning of the material for him.

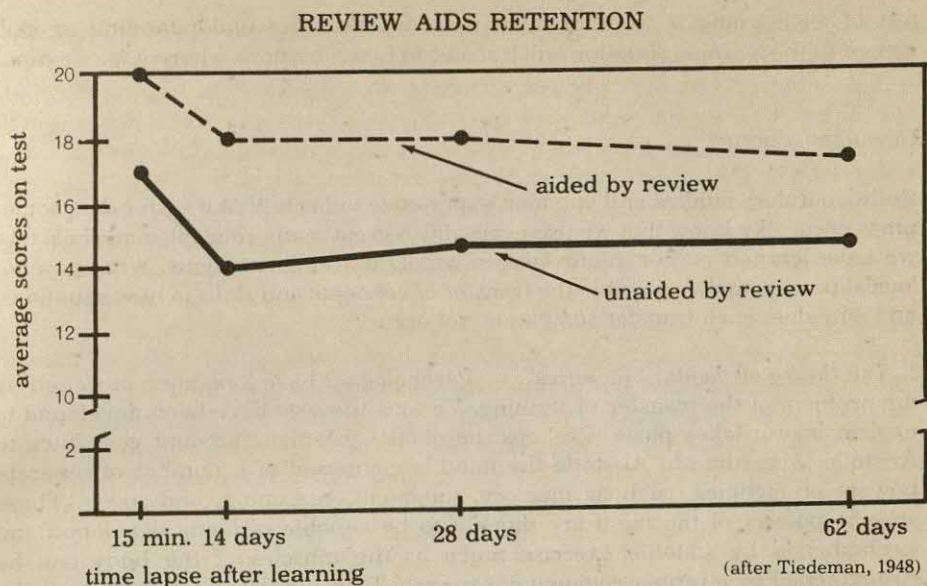
Schools cannot rely exclusively on problem solving for all the review that will be necessary. But in planning original practice and later review, teachers can look for ways to help students see material in the broadest possible context, related to their other knowledge and to their goals and values.

Tests can also be of value in maintaining learning if they are designed and used as diagnostic instruments. Students profit most when they are permitted to study their test results to see where they need further review or where their concepts are in error (Tiedeman, 1948). When a teacher gives his students a test and tells them only the grade they got on it, he does very little toward helping them correct their errors and refine their learning.

Review need not wait until learning is completed. Early studies showed that frequent interruption of study in order to review—recite to oneself—the points covered made learning much more efficient. With factual material, up to four fifths of the total learning time can profitably be spent in such a running review (Gates, 1917). Since this procedure forces the student to use the recall method to check his learning, it usually results in a higher level of mastery and hence in better retention later than if he simply reads the material to be learned and then reviews it by rereading.

In summary, the teacher can help to ensure retention of learned material if he will:

1. Help students learn how to learn effectively—help them realize that it is well-formed concepts and generalizations that are most resistant to being forgotten.
2. Do everything possible to enlist the students' interest and effort in learning. Learning and remembering are improved if the student knows that his learning (a) will be useful later or (b) will solve a problem.



The advantage of review for retaining factual learning is clearly shown in these curves. The subjects were fifth-grade pupils, and the learning was geography facts. Periodic review is a good way of protecting the investment of time put into original learning. As time goes on, less and less review is needed to maintain mastery.

3. Enhance in every possible way the meaning of the material to be learned. This means (a) organizing material clearly and helping learners to see the important relationships; (b) knowing what concepts the learners have to build on; and (c) developing further concepts only as the learners are ready to understand them. Learning without understanding means learning nonsense material, and the retention of nonsense material is very poor.

4. Ensure adequate mastery of material. Work for overlearning of important points instead of stopping as soon as students seem to know them. To do this may mean covering less ground. But in general we may say that thorough learning of fewer but important concepts is preferable to an effort to cover everything so hastily that nothing is really mastered.

5. Maintain learning through review. There are various kinds of review, all useful if used properly. Probably the most effective type is applying the material in new situations—especially in the solution of problems. However, various kinds of quizzes and tests are helpful if students are encouraged to study the results and correct the errors and deficiencies in their learning. Active recitation (review) during learning also aids retention by promoting a high level of original mastery.

USING WHAT IS LEARNED

Thus far this chapter has been concerned primarily with teaching for effective retention. However, as we noted at the beginning of the chapter, the important

test of all learning is whether it is used—whether the understanding or skill gained in the learning situation will transfer to new situations where it is relevant.⁵

How transfer occurs

Both laboratory studies and common experience indicate that transfer *does* sometimes occur. We know that we use every day a great many concepts and skills that we have learned earlier in our lives in widely differing situations. What psychological process makes possible the transfer of concepts and skills to new situations, and why does such transfer sometimes *not* occur?

1. *The theory of mental "faculties"* Psychologists have long been intrigued by the problem of the transfer of training. Various theories have been developed to explain how it takes place. Perhaps the oldest systematic account goes back to Aristotle. According to Aristotle the mind is composed of a number of separate powers or faculties, such as memory, judgment, reasoning, and so on. These specific powers of the mind are thought to be capable of being developed and strengthened by suitable exercise much as the muscles of the body can be strengthened by a proper regimen of exercise. Thus judgment can supposedly be developed by practice on material that calls for judgment. Memory can be developed by strenuous exercises in memorization. The whole educative process, then, becomes a process of rigorous mental exercise. The ultimate outcome of a good education is a "trained mind."

According to this theory, the primary purpose of learning is not to acquire information or understanding but to develop the powers of the mind by exercise. The subject matter to be learned is important solely as the means by which discipline is achieved. Thus for centuries one of the chief subjects in the secondary curriculum was Latin grammar, not because it was regarded as useful to know but because it was esteemed as a disciplinary instrument. As one Latin schoolmaster is supposed to have said, the thing that makes Latin grammar so good for teaching boys is its enormous difficulty!

This faculty theory of mind, together with the mental-discipline idea accompanying it, has been extremely persuasive for centuries. It is probable that more teachers have accepted it as a guiding psychological idea than have accepted all other psychological concepts put together. It was widely accepted among psychologists themselves until around 1900. Today this whole concept is thoroughly discredited by experimental evidence, though it continues to have an important influence on many school practices.

Faculty psychology dealt with the problem of transfer in an interesting and effective way—by dismissing it. Its claim was that a *well-trained* mind could cope with any kind of subject matter under any conceivable conditions. Since it was not

⁵An excellent summary of psychological research on the transfer of learning, together with a chapter on applications to education and several reports of experimental studies of transfer, will be found in *The Transfer of Learning* by H. C. Ellis (New York: Macmillan, 1965). Selected readings on the topic may be found in *Transfer of Learning*, edited by R. F. Grose and R. C. Birney (Princeton, N.J.: Van Nostrand [Insight], 1963).

primarily interested in the acquisition and retention of *ideas*, it was not concerned with the problem of explaining how an idea learned at one time could be made available for use later, or why the individual might fail to think of it despite its clear relevance.

Since evidence fails to substantiate a faculty theory of mind as a psychological principle or mental discipline as a method of education, psychologists in this century have looked for other explanations of the phenomenon of transfer. The two accounts of transfer most widely accepted today are products of twentieth-century psychological theory and experimentation.⁶

2. The theory of identical elements — One account as developed by the American psychologists Thorndike and Woodworth early in the century is usually called the *theory of identical elements*. According to this theory, a person is able to use in a new situation what he has learned in a previous situation to the extent that there are elements in the second which are identical with or very similar to those in the first. Thus, what is learned in Situation A is useful in Situation B (which is new and different) if there are elements in B which are identical with elements in A. If there is no such identity, transfer cannot result and the learner is unable to use in the new situation what he learned earlier.

This may sound like nothing but common sense, but it took a long time for psychologists to develop this theory and find experimental evidence for it. More than that, many teachers who pride themselves on their common sense continually violate the principle because they make completely unwarranted assumptions about their students' recognition of identical elements. Even when such elements are present, they will not facilitate transfer if they are not recognized by the learner.

For example, when a teacher teaches his students a principle of arithmetic, he may presume, because he has taught it so thoroughly, that in a new situation students will immediately perceive its relevance and will proceed to use it. But unless the learner himself sees the identity of elements, he cannot transfer what he has learned, and it makes no difference if everybody else in the world sees it. Not only will it fail to be used in relevant situations *outside* the classroom, but even in subsequent arithmetic lessons its relevance may not be seen. It has long been known that pupils who do well on pure multiplication may be unable to use the process in solving a long-division problem.

Teachers are often dismayed when they have drilled their students in an arithmetical operation and then find that so few see its application in a simple "word problem." Some lose their patience when a forest of arms goes up and the whole class wants to know, "Do we add or subtract?" To the teacher the relation

⁶Studies of factors in transfer have often yielded confusing and contradictory results. For a sampling of the research from which psychologists and educators try to derive general principles, see the following: "Errors in Transfer Following Learning with Understanding: Further Studies with Katona's Card-Trick Experiments" by E. R. Hilgard and others (*Journal of Experimental Psychology*, 1954, 47, 457-464); "A Comparative Study of 'Transfer through Generalization' and 'Transfer through Identical Elements' in Technical Training" by A. I. Siegal and others (*Journal of Applied Psychology*, 1960, 44, 27-30); "Does Training with Differential Reinforcement on Similar Problems Help in Solving a New Problem?" by L. Richard Hoffman, Ronald J. Burke, and Norman R. F. Maier (*Psychological Reports*, 1963, 13, 147-154); and "Transfer in Perceptual Learning Following Stimulus Predifferentiation" by H. C. Ellis and D. G. Muller (*Journal of Experimental Psychology*, 1964, 68, 388-395).

between addition of whole numbers and the solution of this problem is clear. He cannot see how his students can fail to perceive the identical elements!

3. *The theory of generalization* Another way of accounting for transfer was also developed earlier in this century. Credit for its original theoretical formulation and early experimentation to test it goes to Charles H. Judd. Judd's theory is that transfer of learning occurs primarily through *generalization*. It explains how transfer can occur when there are no identical elements but when the same principle fits the two situations.

In one of his experiments Judd had groups of boys throw darts at targets under water. One group was taught the theory of refraction of light when it passes from one medium to another. The other group was not told anything about refraction but was allowed to work out the problem as best they could. First, both groups practiced on targets submerged under twelve inches of water. In the first test there was very little difference in the performances of the two groups. Then the experimenter changed the depth of the water to four inches. It was at this point, according to Judd's report, that a notable difference appeared. The boys who had been taught the concept of refraction adapted their aim to the new conditions much more quickly than those who knew nothing about the principle. Judd's conclusion was that transfer was facilitated because the experimental group was able to apply the same general principle to two situations even though the elements *were not identical* (Judd, 1908).

More than three decades later Hendrickson and Schroeder (1941) repeated Judd's original experiment with some modification. In this experiment three groups shot at underwater targets with air rifles. One group (Experimental Group I) studied the theory of refraction; a second group (Experimental Group II) not only studied the theory but were told specifically that changing the depth of water would change the degree of refraction; a third group (Control Group) was told nothing at all about refraction.

It was found that both the experimental groups did better than the control group and that the second experimental group did better than the first. The differences were not large enough to permit a generalization of great dimensions, however—possibly due to an inability on the part of the experimenters to control all the variables sufficiently. For example, some of the boys in the control group may have had previous knowledge about the principle of refraction.

Taken as a whole, the evidence indicates that general principles learned in one situation can be applied in other situations and suggests further that specific instruction in the application of a general principle increases the likelihood that the principle will be applied. Or put it this way: general principles have more transfer value than isolated facts; general principles plus specific instruction in possibilities of application are better than either (Cassel, 1953).⁷ Transfer, in turn, may be regarded as using either (a) a specific response, previously learned, in a new situation where it is seen as appropriate, or (b) general knowledge, principles, or strategies, previously learned, in meeting the demands of a new situation.

⁷An attempt to teach a generalization to first-graders by means of teaching machines, with specific testing for transfer, is reported in "Teaching Scientific Theory to First Grade Pupils by Auto-Instructional Device" by E. R. Keisler and J. D. McNeil (*Harvard Educational Review*, 1961, 31, 73-83).

Teaching for transfer and use

Unfortunately, as we have seen, the mere presence of identical elements or principles in two situations does not ensure that transfer will occur. What can the teacher do to make transfer likely? He cannot anticipate and prepare his students specifically for every kind of situation they will meet.

1. *Transfer as a specific objective* Perhaps the key point here is that transfer must be one of the teacher's conscious objectives, planned for as carefully as any other objective. This means that the methods he will use in teaching and the ways by which he tests learning will stress students' ability to use their knowledge as well as their simple retention of it. For example, besides teaching and testing for knowledge, a teacher might teach and test for students' ability to translate formal statements or quantitative data into their own words, to interpret data and see implications, and to apply generalizations in new situations.

Since transfer depends on the learner's seeing that something he knows is relevant in the new situation, we can expect more transfer when he has done his learning in the first place with an expectation of utility. If he expects what he learns will be useful, he is more likely to look for ways of using it. Such an expectation, of course, grows out of his own perception of meaning and is not likely to develop just because the teacher tells him the material will be useful some day. But if both pupil and teacher during the learning are concerned with utility and transfer, the likelihood of transfer is greatly enhanced.

2. *Teaching for understanding and generalization* We know that material which is understood is likely to transfer better than material learned by rote without understanding; that facts seen as fitting into a framework will be more likely to transfer than isolated facts; that concepts, principles, and generalizations transfer more readily than discrete bits of information. The reason is the same in each case: The broader the context in which meaning is seen during learning, the more the likelihood that a learner will *see* identical elements when they are present in new, somewhat different, situations and *recognize* that the same broad principle applies, despite the surface differences. The problem-solving method is one way of ensuring that new learning takes place in a meaningful context and that important relationships are seen and learned.

The more specific and limited the learning, on the other hand, the less it will in fact have in common with later, different situations. A child who learns to say, without understanding, "The interior of the globe . . ." learns only those words and not the relationships that they are describing, much less the implications of these relationships. Therefore, what he has learned cannot possibly transfer to a discussion in the classroom of whether the center of the earth is hot or cold.

Investigators at one midwestern university made use of programed audio-visual materials to effect a high level of transfer of learning to a practical situation—teaching incoming freshmen to use various library facilities and services (Wendt and Rust, 1963). Their program included the presentation of Kodachrome slides as well as "performance frames" which required the learner to perform such actions as looking up an entry in the card catalog. These investigators point out that verbal instruction alone often results in little else than verbalism and

hence in a low level of transfer to actual situations. Their evidence shows the advantage of going beyond the printed or spoken word in teaching for transfer.

3. *Teaching for a high level of retention* Good retention, as we have seen, is not a sufficient condition for transfer, but for most school-related tasks it remains a necessary one. Therefore, besides enhancing meaning and striving for generalizations, the teacher interested in transfer will also work to promote efficient learning in the other ways suggested on pages 463–467. This means working for interest and active involvement on the part of the learner, allowing ample and meaningful practice, continuing learning to a high degree of mastery, and providing for review.

4. *Planning practice in using what is learned* For maximum transfer, practice in using a response is as important as practice on the response itself. This means that some practice either during or following the original learning should be specific practice in using the response in many varied situations. Only as the individual can count on his new response to be quick and reliable will he use it. If he does not feel secure with it in a complex situation, he may revert to an older “tried and true” approach with which he feels more at home.

5. *Teaching transfer skills* The broad abilities used in transfer can themselves be taught and learned. Students can be helped to develop better techniques of defining key elements, comparing and contrasting, looking for relationships, analyzing, reasoning, and formulating hypotheses. These are not “faculties” that more practice will develop but skills that can be built up if their component parts are learned.

Often in a new situation the response or principle must be adapted or combined with other information or generalizations. Sometimes only a part of the original material will be called for in the new context. Facility in making such adaptations does not come automatically but is itself a difficult learning that requires practice and is aided by good instruction.⁸

Since the key to transfer is the individual's perception that certain information or principles or skills are relevant in a new situation, it is especially important that he have practice in defining new situations, in diagnosing the demands they are making, and in identifying the key elements. Therefore, part of a teacher's efforts should go into helping students learn how to define and structure new situations.⁹ Review problems lose much of their value if the pupil knows in advance that they are all going to call for the same process. Instead, after he has mastered a process, he needs to come unawares, from time to time, on situations where it is applicable, and if he does not see its applicability the teacher must help him discover it.

As we have seen, sometimes transfer occurs but is negative instead of positive: the earlier learning interferes with the later task instead of making it easier.

⁸For a provocative article suggesting that it might be more fruitful, instead of talking about the broad concept of transfer, to be concerned with the many component skills that are involved, see “The Problem of Transfer” by W. C. Trow (*Phi Delta Kappan*, 1958, 40, 68–71).

⁹The importance of the relation between transfer of learning and problem solving is discussed in some detail by Ellis (op. cit., pp. 66–69). He cites several relevant research studies.

Interference can also hinder new learning when a mental set or a general principle is carried into a new situation that *seems* to be similar but actually is not. In one study, for example, the experimental group was given a series of problems that could be solved in three steps, while a control group received no such training. After the experimental group had learned the principle, both groups were presented with a problem that could be solved in a very simple way in only two steps. The control subjects readily solved this test problem by the simple method while the experimental group went through the more involved three-step method (Luchins, 1942).¹⁰

In the same way, learning of new attitudes is often made difficult by interference (negative transfer) from contradictory existing attitudes, and new generalizations that contradict one's previous conclusions are resisted. Where teachers encounter firm resistance to new learning, negative transfer may be occurring.

SUMMING UP

To the psychologist, retention and use of learning are two parts of the broader phenomenon of learning. They involve two distinct and somewhat different psychological mechanisms and must be measured and studied in somewhat different ways. But in the complex process of classroom teaching they lose their separate identities. For the teacher they combine to form the crucial issue of all teaching.

The answer to the perennial question of whether teaching can ensure a high level of retention and use is "Yes—under proper conditions." In this chapter we have learned something of the psychological principles involved in teaching for retention and use of learning. In summary we have found the following conditions important:

1. For maximum learning and best retention, students need to be guided in developing efficient methods of study and problem-solving techniques. These techniques can be learned—indeed, they can be obtained only through learning; no one is born with them. A teacher can help students understand that learning means more than just memorizing. He can help them establish efficient study habits and take responsibility for their own learning. He can help them learn to approach new situations analytically—to look for the important elements, the key concepts, the important generalizations, the fundamental structure of the material. He can help them realize that it is the generalizations that will stay with them and will later be useful.
2. What is to be learned must be meaningful to the learner. It must be appropriate to his particular level of maturity. It must be something that he can relate to what he already knows. Only then can the teacher expect learning to be efficient, and retention and use to be high. The alternative to meaningful learning is rote learning—learning that is seldom useful and quickly lost.
3. Students should continually be encouraged to be alert for opportunities to use their knowledge and apply their generalizations. For transfer to occur outside

¹⁰The Reading at the end of this chapter by Birch and Rabinowitz reports an experiment in which existing attitudes and concepts interfered with problem solving.

the classroom, it is necessary that students practice transferring within the classroom as part of their original learning. They need to practice not only the isolated concept or skill but also the use of it in a variety of different contexts.

4. Although we no longer talk about faculties of the mind, we recognize that reasoning, judging, memorizing, and analyzing can be improved through being made more efficient. We can improve our general ability to analyze, define, interpret, draw generalizations, and evaluate through learning more efficient techniques. As the teacher helps students with this kind of learning, he is improving, at the same time, their ability to keep what they have learned and their skill in using what they know.

Reading

Herbert G. Birch and Herbert S. Rabinowitz

THE NEGATIVE EFFECT OF PREVIOUS EXPERIENCE ON PRODUCTIVE THINKING

To teach students to use what they know in solving a new problem, it is sometimes as important to help them learn how to prevent or overcome negative transfer as to work directly for positive transfer. To avoid the kind of interference demonstrated in the following article, students need help and practice in learning to identify the exact requirements of a problem in analyzing both familiar and unfamiliar characteristics of the available resources, and in challenging their own preconceptions and assumptions.

The part which is played by past experience in human problem-solving behavior has long been a subject for experiment and discussion. Investigations viewing the evidence from different theoretical vantage points have arrived at diverse conclusions, which in some instances identify problem solving with trial-and-error learning, in other cases consider past experience in general as providing the raw materials out of which a problem-solving response may be fabricated, and on occasion some investigators have even neglected to consider the question of past experience as essential for a problem-solving theory. One of the reasons for the diversity of roles which have been accorded to past experience is that problem solving is by no means a unitary process. Although in all problem solving a solution is arrived at, the processes of behavior whereby the solution is achieved are of several different kinds. Maier (1945) has served to clarify this issue by sharpening the often belabored distinction between *reproductive* and *productive*

thinking. His discussion was developed in terms of the part which past experience may play in each type of performance. Reproductive thinking, Maier believes, is characterized by the solution of problems by means of the existence of stimulus equivalences in the novel (or problem) situation and in the previously mastered situation. Thus, for him, reproductive thinking and transfer of training are to be considered closely similar if not identical phenomena. *Productive thinking*, however, is not merely the process of arriving at a solution through the direct application of previous learning. In productive thinking past experience is re-patterned and restructured to meet current demands, and is thus the counterpart of reasoning as Maier has defined that term. In the present study we are concerned with the relation of past experience to the productive thinking process, and not with reproductive thinking.

Probably the studies which have contributed most directly to an understanding of the manner in which the background of past experiences influences the nature of human productive thinking are those of Maier and Duncker (1945). Maier, in his examination of the relation between stimulus equivalence and reasoning, identified several ways in which past experience may affect problem-solving activities. Problem solving may be facilitated by equivalences which exist in the immediate problem situation and in past experience. Further, as he has shown elsewhere, and as Birch (1945) has shown for the chimpanzee, the background of past learning represents an essential repertoire of behavior which must be available for restructuring when new situational demands develop. On the other hand, productive thinking is impossible if the individual is chained to the past. The past experience may become a hindrance and an obstacle which blocks productive thinking and reduces behavior to stereotyped and fruitless essays.

It is primarily with this negative effect which may be exercised by past experience that Duncker has dealt in his problem-solving experiments. In a series of situations designed to study what he terms "functional-fixedness," Duncker tried to determine the manner in which the previous utilization of an object for a dissimilar function in the *same problem context* affected its availability in subsequent problem solving, and found that such specific experience made the objects previously utilized in this manner significantly less available as instruments when the problem presented for solution was changed. Two weaknesses in experimental design limit the generality of the inferences which may be drawn from Duncker's results. In the first place, by using the same objective situation for both his "pre-utilization" experience and for his new problem-solving task, he makes it impossible to determine whether the difficulty in using a previously utilized object for the solution of a new problem derives from the limitation of the functional properties of this object by the prior experience, from the establishment of false problem-solving directions, from the development of attitudes of completion ("over and done with") on the part of the *S* which effectively remove the already-used object from the field of activity, or from any of a variety of other effects. Secondly, in selecting the different tools which would be available to the *Ss* in their problem-solving activities, Duncker made no attempt to equate the instruments for different degrees of objective adequacy as tools in solving the problem. Obviously, if the objects in the "pre-utilization" group are objectively less adequate as tools than are the non-pre-utilized materials, the scales are weighted in favor of fewer solutions for the "pre-utilization" group. In not a few instances Duncker's

problem situations may be criticized on these grounds, and the question arises as to whether his results derive as much from the pre-experimental object selection as from the effects of pre-utilization of the materials by the subjects.

To remove these impediments to interpretation of this aspect of the effects of previous experience on problem solving, it is necessary to study the problem under conditions in which the background of prior specific experience is obtained by the Ss in a situation remote from the crucial problem-solving task, and to contrast as problem-solving tools objects whose adequacy as instruments is objectively equal. The design of the present study stems from these considerations.

Subjects and procedure

Twenty-five students at the City College, New York, were used as Ss in this experiment. These Ss were divided into three groups, a control group and two experimental groups. The control group had 6 Ss, and the experimental groups contained 10 and 9 Ss, respectively.

As the crucial problem-solving task in this experiment, all Ss were required to solve the two-cord problem used extensively by Maier in his studies of "direction" in problem solving. In this problem the S is required to tie together the free ends of two cords which are suspended from the ceiling to the floor of a corridor. The distance between the two cords is such that the S cannot reach one cord if the other is held. In our arrangement the problem could be solved only if the S would tie a weight to the end of one of the strings and thus convert it into a pendulum which could be set swinging and then be caught on its upswing while the stationary cord was held. The two cords could then be tied together and the problem solved. In our situation only two objects could be utilized as weights. The first of these objects was an electrical switch and the second, an electrical relay. The conditions of pretest training involved the acquisition of differential prior experience with these objects by our Ss. The pretest training was conducted as follows:

Group S contained 9 Ss who were given the pretest task of completing an electrical circuit on a "bread-board" by using a *switch*, which had to be installed if the circuit were to be completed and controllable.

Group R consisted of 10 Ss who received pretest training in the completion of an identical circuit by the use of a *relay*, which is essentially a switch.

Group C, the control group, consisted of 6 engineering students with a wide variety of electrical experience. These Ss were given no pretraining. The Ss in groups R and S had had little or no experience with electrical wiring.

Shortly after having completed the pretesting tasks, the Ss were presented with the two-cord problem and asked to solve it by using the objects lying before them on a table. Only two objects were present, a *switch* and a *relay*, each identical with the ones used in the pretraining period.

Since the two-cord problem is very difficult to solve without the presentation of "direction"-producing hints, such hints were presented by E 9 minutes after the presentation of the problem. The hints consisted in brushing against the string or strings and "accidentally" setting them swinging. Solutions were always achieved within 3 minutes after the presentation of hints. All Ss were individually tested. Upon completing the two-cord problem, the Ss were asked why they had chosen either the switch or the relay as the pendulum weight.

Results

The results reported will deal primarily with the nature of the choice of objects made by the Ss in the critical task situation. These data for all groups are shown in the table. The control group chose equally between the switch and the relay as pendulum weights which might be utilized for the solution of the two-cord problem. These data indicate that for individuals with prior experience which is not heavily weighted in favor of either the switch or the relay, no significant difference exists between the objects in terms of their utility as tools in solving the two-cord problem.

FREQUENCY OF CHOICE OF OBJECTS
IN PROBLEM SOLUTION

Group	N	No. using relay	No. using switch
Control (C)	6	3	3
Exper. (R)	10	0	10
Exper. (S)	9	7	2

The behavior of the Ss who had received specific pre-utilization experience with either the switch or the relay differed in a striking manner from the behavior of the Ss who had not received such experience. Those who had initially been trained to complete an electrical circuit with a relay never utilized this object as the pendulum weight for the solution of the two-cord problem. In every instance the Ss chose the switch, an object not previously manipulated, as the object which was to be converted into a pendulum bob in the solution of the two-cord problem. On the other hand, the Ss who had initially been trained to use a switch for the completion of an electrical circuit preponderantly chose the relay as the pendulum weight in solving the two-cord problem.

If the results on solving the two-cord problem for both the switch and relay pre-utilization groups are combined, it is found that 17 of the 19 Ss used that object with which they had had no pre-experimental training as the problem-solving tool. There are less than five chances in one hundred that such results could have occurred as the result of chance fluctuations in responding on the part of the Ss. It may, therefore, be inferred that the nature of the previous specific experiences of the Ss were influential in determining their problem-solving choices.

The replies which the Ss made to the question, "Why did you use the switch (or relay) as the pendulum weight?" further indicate that the pre-utilization experiences exercised a decisive effect upon their problem-solving efforts. Those Ss who used the switch as the pendulum weight in the two-cord problem offered varying reasons for its superiority over the relay as a pendulum bob. They claimed that it was easier to attach, more compact, etc. The Ss who tended to use the relay as the pendulum bob in solving the two-cord problem proffered equally "good" reasons for their selection. The relay, they claimed, was easier to attach, heavier, etc. In both groups of Ss individuals became somewhat defensive when queried as to the reasons for their choices, and typically replied by prefacing their answers with the remark, "Anyone can see that this one is better as a pendulum weight." A number of Ss even went so far as to say, "any fool can see that this one

is better." Since these remarks are directed with equal vehemence at either the switch or at the relay, it is clear that the Ss were not advancing objective reasons for their choices, but were, rather, revealing the effects which their prior specific experience was having on their perceptions.

Discussion

Although the present study was designed primarily to explore a neglected aspect of problem-solving behavior, it has some significance for problem-solving theory and provides clarifications for several important questions. In the first place, the results reveal that the question of the role played by past experience in productive thinking cannot receive a uniform answer until the nature of the past experience is clearly understood. Even though this study indicates that prior experience of a specific kind with a potential problem-solving tool effectively prevents this instrument from being used in problem solution, there is little doubt on the basis of other studies that a different kind of experience may enhance the value of an object as a tool in problem solving. Therefore, what appears to be important for problem solving is not that an individual's performance is dependent upon past experience per se, but rather that *different kinds* of experience are differentially effective in influencing the content of problem-solving behavior. Our results therefore are in accord with those of Katona, who found that *how* and *what* an individual learned and not simply *whether* he learned determined the amount of positive transfer effect that occurred in subsequent learning.

Perhaps the most interesting phase of our results concerns the manner in which the individual's previous experience influenced his perceptions. The pre-utilization experience apparently changed the perceived properties of the object previously used in a different context to such a degree that its problem-solving characteristic could not be readily seen. This change in perception was probably based on the manner in which the previous experience had emphasized the instrument as an *electrical object* and so made for extreme difficulty in perceiving it in terms of its general characteristic of *mass*, which is essential for pendulum construction. The kind of previous experience presented therefore functioned to limit the number of the properties of the object that could be perceived by the S.

These results suggest that there are two phenomenally describable kinds of learning that may be important in problem solving. The first variety of learning involves the acquisition by S of certain broad, nonspecific, general notions about the properties of the object or method experienced. This was undoubtedly the case in Birch's study of chimpanzee problem solving, where young chimpanzees who were initially incapable of using a stick to take distant food into reach manifested this ability after a very short period of play with sticks. It is this general, broad, nonspecific experience which seems to provide the repertoire of experience essential for productive thinking.

A second type of learning involves the acquisition of experiences which convert the initial perception of broad general properties of an object into perceptions of specific limited functional characteristics. It is this second variety of learning which appears to have occurred in the pre-utilization experiences of the Ss in our study and to have produced what Duncker refers to as "functional

fixedness" in problem-solving perceptions. Such fixedness limits the range of perceptual organizations capable of being developed by the *S* and so interferes with problem solving.

Summary

The present study was designed to investigate the effects of specific experience with objects in unrelated situations upon their utilizability as problem-solving instruments. The results revealed that specific prior experience limited the perception of object properties and made the experienced materials less available as problem-solving tools. These results are discussed in connection with Duncker's hypothesis of "functional fixedness," and as contributions to the general areas of transfer and of productive thinking.

EVALUATING LEARNING AND TEACHING

From the age of five until, perhaps, eighteen a child spends from two to seven hours a day in school—five days a week, nine to ten months a year. All the time he is in school he undergoes new experiences from which he learns.

The question is, is he learning what the school wants him to learn? Is he learning these things poorly or aptly? In previous chapters you have seen what the school and society want children to learn. Now you will examine the problem of appraising how well the child learns. What is the quality of his learning? How can you tell? Why do you need to know?

In Chapter 3 we advanced the idea that the overall purpose of education should be to facilitate the development of children toward maturity. We suggested that although maturity is a complex criterion, there are five major elements on which there is wide agreement. These are: (1) the attainment of an adequate self-concept; (2) the development of one's intellectual and physical capacities; (3) the ability to cope with reality without undue stress; (4) the development of concern for others; and (5) creative participation in social life.

We have not maintained, of course, that these are the sole responsibility of the school. We have, however, maintained that the school does have important responsibilities with respect to every one of them. The main point we wish to make in this final chapter is that evaluation of the various aspects of the school's program should be done in terms of the criterion of maturity.

With maturity as our goal of education, the quality of learning is gauged by how well the learner is developing that maturity. This, in turn, depends upon the quality of the teaching he receives. Thus evaluation of learning inevitably involves evaluation of teaching.

WHAT IS EVALUATION?

Evaluation in the traditional sense has consisted largely of measurement and rating in the form of grades. Perhaps you can see better where measurement fits

into evaluation if you compare an achievement test with a ruler. Using a ruler you can measure a board for length, width, thickness, and then determine the number of board feet it contains. When you have finished you have measured the board, but have you evaluated it?

Your measurements will tell you whether the board is long enough or thick enough to be used on the top of the table you are making, but they will not tell you certain other important factors. Is it the right variety of wood? Does the grain match that of the other boards in the table? Is it free from knots and imperfections? These questions are quite as important in your "evaluation" of the board as are the dimensions.

The analogy is evident. A teacher administers a test in arithmetic to a class. He scores the responses and obtains certain data which indicate the number of arithmetic examples individuals can solve correctly in a given amount of time. He has taken a measure of the arithmetic achievement in his class.

This is important information, but it does not give the teacher all he needs to know for full evaluation. What was his aim as he taught the various arithmetic processes to his class? Did he know what each child was capable of? How ready were the children for this learning experience? Unless he knows all this and more, he can hardly evaluate realistically.

Suppose he finds from his test that the average of his fourth grade in January is equal to the first month of the typical fourth grade as shown by standard norms. Does this speak well for his group? Should he feel encouraged or discouraged? What other factors should he take into account in evaluating the arithmetic achievement in his class?

When done properly with suitable instruments, measurement yields important data for the evaluation process, but that is all. The teacher's measuring tools are described later in this chapter.

Real evaluation encompasses much more than measurement and rating, although they play a part. With maturity as the eventual goal, evaluation from our perspective becomes a broad process and differs in three significant respects from the narrower conception:

1. Measurement and rating take on an analytic and diagnostic function rather than a punishment and reward function. Evaluation is no longer a *judgment* upon the child. It is an *illumination* of his strengths and weaknesses, his lacks and his gains so that (1) the child may use the findings to improve his learnings and grow, and (2) the teacher may use what he sees to improve his handling of the learning. In this sense evaluation becomes an integral part of the learning process.

2. Evaluation can no longer be a final process marking a conclusion. It takes place continuously as part of the learning, not only at the end as a "post mortem" of it.

3. Evaluation takes place always in relation to aspects of maturity. The clearer the goal, the more effective the evaluation. With this concept of evaluation, there is much more emphasis on planning—(1) on making a plan and (2) on knowing exactly what the short-range goals are for each thing planned.

The importance of clearly defined objectives for the evaluative process cannot be overstressed. It is axiomatic, of course, that evaluation can be done only with respect to the objectives that are to be achieved. Unless these objectives are formulated clearly, it is difficult—if not impossible—to assess progress with any

precision. Progress is always progress toward something and if this something is not clearly perceived there is not much hope of useful evaluation. It goes without saying that in the absence of clearly defined goals the whole teaching-learning process itself is likely to be haphazard and without direction.

The matter of educational objectives is a complicated one and there are at least two major kinds of difficulty involved. One of these difficulties stems from reliance on goals that are so general and remote that they offer little guidance for the day-by-day work of the classroom. In this case, what is called an objective, or the objective, becomes a kind of glittering generality that can be discussed in abstract terms in a staff meeting but offers little or nothing to teachers whose business it is to plan *specific* learning activities for a class. This is one reason why teachers often look with suspicion on global objectives and enter into discussions of them with an air of pained resignation.

The other difficulty lies at the opposite extreme. As we have already observed many times, the actual work of a teacher is a practical matter involving highly specific plans and activities. For this reason, teachers often tend to be concerned exclusively with short-term goals: seeing that the class finishes the next five pages in the workbook; teaching a list of spelling words; ensuring that students can do the proof for a geometric theorem; and so on and on—but this can be overdone too. The point here is not that these objectives are not worthy or appropriate, for certainly in some contexts they may be. The difficulty lies in the fact that some teachers never consider anything beyond the limits of these day-by-day and excessively limited objectives. An observer who was perhaps overly cynical once remarked that the obvious objective of some teachers seems to be to get through from Monday morning to Friday afternoon without falling apart completely.

In recent years, various psychologists have laid great emphasis on the importance of careful formulation of short-term goals, or as they are often called, *specific objectives*. In general, these psychologists have insisted that specific objectives must be stated in *behavioral* terms and that to the greatest extent possible language that requires inferring the mental states of pupils should be avoided.

This means, for example, that objectives stated in such terms as *knowing*, *understanding*, *appreciating*, *being aware of*, are too vague, too undefined, and too intangible to offer much guidance either in planning specific learning activities or in assessing the achievement of students. The point is not so much that knowing and understanding and appreciating are not important or desirable. It is rather that these are not very useful terms to use in formulating *specific* instructional objectives. Thus a teacher who is thinking about his objectives in conducting a lesson or planning a unit of instruction will do better to express them in such specific operational terms as: *state*, *classify*, *compare*, *describe*, *contrast*, *construct*. He will do better because these are behaviors that can be observed in his students and they can give him specific guidance in carrying on his teaching and in evaluating outcomes.¹

One of the most significant developments in the effort to specify educational

¹In Chapter 2 of *Measuring Pupil Achievement and Aptitude* (New York: Harcourt, Brace & World, 1967) C. M. Lindvall emphasizes the importance of specific instructional objectives. *Preparing Objectives for Programed Learning* (San Francisco: Fearon, 1962) contains principles and procedures for formulating specific educational objectives that are applicable to other forms of instructional design, although the discussion is oriented primarily around programming.

objectives more clearly has been the preparation of *taxonomies*, or classifications, of educational objectives. In general, the procedure used in preparing these taxonomies is to analyze desired learner behavior into its component parts and then fit these parts into an inclusive scheme or matrix. In this way it is possible to specify relatively limited objectives with clarity, yet also show the place they occupy in the broader spectrum of objectives. Taxonomies have been published for the cognitive domain of behavior and for the affective domain.² The cognitive domain includes objectives which involve remembering or reproducing material which has been learned or with the development of intellectual abilities and skills. The affective domain includes objectives which involve interests, emotions, attitudes, and values. In addition to presenting an orderly classification of educational goals, these volumes contain sample test items designed to measure the various objectives.

There is little question but that the movement to make educational objectives more specific and objective, whenever it has been heeded, has had a beneficial effect on teaching and on evaluating educational outcomes. Nevertheless, there is an inherent danger here that should not be overlooked. The danger lies in the possibility that we may become so involved with specific, and therefore limited, objectives that we lose sight of what it is these objectives are supposed to contribute to. In such a case, a specific learning activity can become an end in itself and the whole design for teaching—and hence for evaluation also—becomes fragmented and atomistic. At the worst, the whole curriculum can become a series of discrete items in which the student sees few, if any, interrelationships.

Not all educational goals—even those that may appear to be quite specific—are equally susceptible to the kind of objective statement and appraisal that some psychologists recommend. Speaking comparatively, it is easy to specify specific immediate goals for learning reading skills or numerical operations. Progress toward these goals can be assessed with considerable precision because we have reliable instruments available for measurement of this kind of progress. Certainly few, if any, teachers would question the importance of such achievement.

On the other hand, there are other aspects of growth toward maturity that do not lend themselves so easily to objective measurement. A teacher who is genuinely concerned with contributing to the total development of a student is concerned with the progress of socialization, the development of a favorable self-concept, and other matters that are often viewed as intangible and therefore difficult to appraise in any other than a global fashion—which usually means no real appraisal at all.

Take Sam, for example. Sam, a junior-high student, has long since shown himself to be compliant. When the teacher assigns homework or asks a question in class, Sam will almost always attempt to comply with the demands that are made on him. But that is the most that can be said for Sam in this respect and there is reason to think that if he were not under pressure, he would probably not bother to pursue the matter in question. An important educational problem in Sam's case is to help him move from doing things only because the teacher asks him—that is,

²*Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain*, Benjamin S. Bloom, Ed. (New York: David McKay, 1956). *Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook II: Affective Domain*, D. R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, Eds. (New York: David McKay, 1964). Summaries of these handbooks appear as the Reading at the end of this chapter.

from simple obedience—to a more active and interested involvement in classroom activities. The goal for Sam is the development of a *willingness* to respond and eventually what might be called creative participation.

Now this is as much a learning objective as the learning of long division or Newton's laws of motion—and in many cases it may be considerably more difficult to achieve. Whatever progress Sam makes will be made as a result of specific experiences. Part of the process of evaluating Sam's total progress will necessarily involve assessment of how each experience has contributed to *his* growth in involvement and willingness to participate. Obviously, the problem of individual differences is very important here. Pupils differ widely with respect to degree of involvement and their willingness to respond. The teacher, therefore, is faced with projecting a goal for Sam that might not be appropriate for the boy sitting next to him.

As Krathwohl and his colleagues have shown in the *Taxonomy of Objectives: Affective Domain* (pp. 118–138) a certain amount of objective assessment of this kind of progress is possible and they have made specific suggestions about the use of various kinds of procedure for doing this. There can be little doubt, however, that any effective assessment in the affective domain will also depend to a significant extent on the sensitivity and observational powers of the teacher. The chances are that it may often be the teacher alone who is in a position really to observe and to make judgments about the growth of a pupil with respect to involvement and willingness to respond.

It is important that a teacher perceive cognitive development and development in the affective realm not as discrete factors, but as integral parts of the total matrix of experience. A teacher who can perceive the learning situation in this fashion will see that the two go together. They must be planned for together and they must be evaluated together.

The real problem in curriculum construction, of course, is to formulate inclusive objectives for the guidance of the total educational process and then plan the specific kinds of activities that are required at different levels of the school system to contribute to the realization of the overall objectives.³ This is a task that cannot be done exclusively by educational administrators and curriculum experts, although they have an important part to play. A high percentage of all specific learning activities take place in classes under the direction of teachers and, therefore, whether the long-range objectives of the learning process actually are achieved probably depends more on the wisdom and skill of the teaching staff than on anything else.

LEARNERS SHARE IN EVALUATION

The idea that learners should be encouraged to engage in systematic appraisal of their own learning is relatively new in school practice. Russell said sometime ago

³David R. Krathwohl discusses the process of developing objectives for instruction in an article, "Stating Objectives Appropriately for Program, for Curriculum, and for Instructional Materials Development" (*Journal of Teacher Education*, 1965, 16, 83–92). His discussion involves the broad, continuing objectives that are necessary for program development and the relation to these general objectives of the more detailed and specific goals associated with teaching.

that self-evaluation has been accepted as an idea but has rarely been put into action (1953). His observation is probably still accurate for many schools.

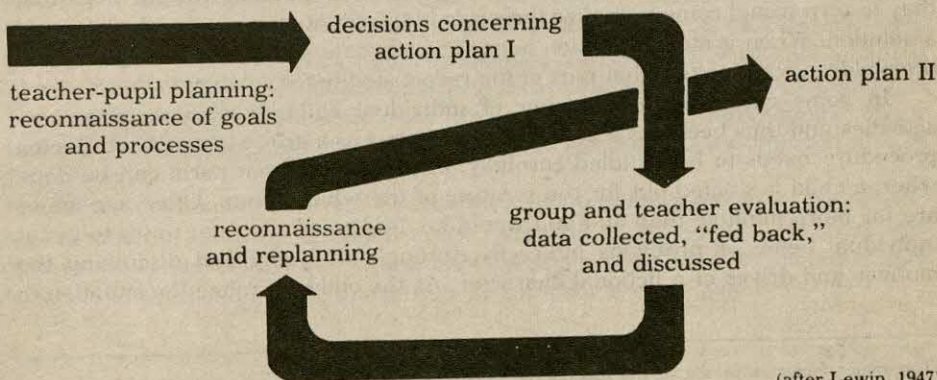
Why learners need to participate

We have already discussed the need for students to take responsibility for their own learning. They can do this only if they have a clear picture of how they are doing, where they need to improve, and how to go about it. But too often the teacher tells a student only that he "passed" or "failed" or "got a B"—not how this judgment was arrived at, what criteria were involved, or what data were used. In such cases, the meaning of the teacher's judgment is so restricted that the student learns little from it and can hardly be expected to use it in improving his future performance. Even where the teacher makes an effort to give a more detailed evaluation, it means more to a child if he has a hand in appraising what he got out of an experience—what he contributed to an activity, what progress he has made, and where and why he needs to improve. If the feeling of need for improvement comes from within himself as a result of his own perception and analysis, he will have more motivation for making improvement than if someone tells him he needs to improve. Analyzing for himself and seeing that he has succeeded here and failed there and *why* is a powerful motivational force toward subsequent learning. He must see the problem as his own if he is to grow in the self-direction required of a mature individual.

In the classroom, cooperative planning and evaluation can be done in a large group or in a small group or on an individual basis. Since most learning activities are carried on in groups, it is natural for planning and evaluation to take place in a group atmosphere. Evaluation can be a learning tool in almost every phase of classroom living. Its use may range from the analysis of a project to the examination of personal behavior. The possibilities are endless.

Before launching a learning activity, teacher and pupils together take stock to determine where they are, how they stand. This is evaluation. Then they determine where they want to go and how to get there. This is planning.

PLANNING-ACTION-EVALUATION CYCLE



(after Lewin, 1947)

As the work gets under way, the evaluators continually take stock of what they are doing, appraising and weighing what is being accomplished and what remains to be done. They figuratively ask themselves these questions: Are we heading in the right direction for our goal? Are we taking the most desirable way, the way that will yield the richest learnings? What changes do we need to make in order to reach our goal?

And when the project has been completed there is further stock-taking: Did we get where we wanted to go? What have we accomplished?

But evaluation does not end here. There is further planning for future activity. These are the questions they ask: If we did not reach our goal, why did we fail? What should we have done differently? Has this been a valuable use of time or a waste of time? Could the time have been used better for some other activity? What more can we do? Now that we are here, where do we want to go next?

In each of these stages you can see how evaluation and planning are interrelated. The Association for Supervision and Curriculum Development (1954) sees all these as evaluative activities: identifying problems to be solved, selecting questions to be studied, clarifying objectives to be achieved, diagnosing pupil needs, selecting teaching aids, and deciding to organize particular learning activities—in other words, all the decisions involved in what you are going to do and why, the method you use, and how well the results measure up to expectations.⁴ When group behavior problems arise, the class or the group involved can examine them together and try to work out ways of correcting the difficulty. For example, teachers have observed that one of the big behavior problems on the playground is the interference of older children in the play of smaller children. At one school several first-graders kept complaining to their teacher that the third-graders were continually running across their play area and breaking up their games. Evaluating the problem cooperatively with the class, the teacher brought out the fact that the first-graders did not understand the playground map and were encroaching upon the area set aside for the older children. Through this discussion, the first-graders came to realize that they were at fault and achieved a clear understanding of the map so that they knew exactly where they could play in peace.

If it had turned out that the first-graders were not at fault, they could have presented the problem to the third-graders for their evaluation with the hope that they in turn would come to realize their role in the situation and take steps toward a solution. When group evaluation is used to alleviate group behavior problems, the children come to feel that part of the responsibility for solution is theirs.

In some cases the misbehavior of individual children disrupts classroom activities and thus becomes a problem for the class as a group to work out. Such a procedure needs to be handled carefully, however, for great harm can be done when a child is singled out for the scrutiny of the whole group. Often age-mates are far more punitive than an adult would be. It is generally safer to try to get at individual behavior problems indirectly, through analyzing and discussing the motives and drives of a fictional character. As the children relate the situation to

⁴The major factors involved in the evaluation process are discussed extensively in *Evaluating Pupil Growth* by Stanley J. Ahmann and Marvin D. Glock (Boston: Allyn and Bacon, 1963).

themselves, some of them may come to understand reasons for their own misbehavior. They may even respond with comments such as, "You know, I used to do that." Except for such self-evaluation as may result, the teacher should try as a rule to keep these discussions general and impersonal.

With emphasis on analysis rather than criticism, the class can evaluate individual performances in group discussion for the constructive purpose of figuring how matters may be improved. This may help students do better both as group members and as group leaders. For example, they can recognize who needs to participate more, and see who is monopolizing activities and needs to tone down his participation so that others have a chance. After each student's performance in a leadership capacity, he and the others can discuss his good points and his weak points so that next time he may improve.

Operating within an established framework

Clearly established standards help a classroom group to carry out planning and evaluating. Students then know and understand what they are looking for. Such standards have the most meaning and result in the best evaluation when they can be established cooperatively, rather than being set by the teacher.

Experienced teachers have found that students can help to plan almost every part of the classroom program: their time schedule for the day, use of free time, work periods, special activities, exhibits, field trips, rules of conduct for certain occasions, clean-up duty, and more. It is probable that planning as extensive as this is more easily done in elementary schools which are not departmentalized. The departmental organization, which is the rule in most American secondary schools, restricts opportunities somewhat because, typically, students are with a teacher for only one period in the day. The more flexible arrangements now being introduced into some high schools (as for example, Mr. Frederick's high school in Chapter 2) will make possible more student-teacher planning than is possible under the conventional departmentalized system. Even so, many high-school teachers have found ways to give students an important part in the learning and evaluating process.

There are not many schools, of course, where the choice of *what* will be studied is unrestricted. Wherever this does occur, teacher-student planning opportunities are virtually unlimited. In general, a teacher and his class will have to work within certain limitations. Certain studies are required; others are optional. Usually, however, a teacher and his student will have considerable freedom in deciding how to proceed within the framework of such requirements. Much depends on the willingness of the teacher to give his students a significant part in the process.

Thus, even though *what* will be studied is likely to be specified by the school, the *how* and the *when* are often left to the discretion of the individual teacher and he may share the planning of these with his pupils. This view of planning, and therefore of evaluation, was summed up by Giles some years ago:

Planning, now, means two things—the planning of the teacher before he meets his class, and the planning of the teacher and the class together. Teacher-planning becomes an effort to think of many possibilities,

materials, methods of class organization, and purposes. Class-planning becomes a process of intelligent formulation of purpose and a method for achieving it by the learner with a group of learners. (1954, p. 4)

When there are limits to what the class may plan, these should be made clear beforehand. Otherwise the teacher may find it necessary to veto plans on which time and thought have been spent and to which the planners have become attached. Such an occurrence can create resentment between pupils and teacher.

Making cooperative planning work

Planning sessions can become largely the group's responsibility with the teacher turning over leadership to a student and taking the part of a group member. Often he may have to guide the session, by coaching to keep the group on the subject, helping them clarify their own ideas, and seeing that they explore all possibilities. This can be done indirectly, through the use of questions or suggestions, rather than in an autocratic manner. In some cases children do not have the background to know what alternatives are open to them. It is then up to the teacher to serve as an informant. With small children it may be necessary for the teacher to divide the planning into segments in order to give them direction.

The element of appraising learning experiences for their value is important when it comes to planning time schedules or deviating from the regular schedules. There are only so many minutes in a school day. And sometimes the period routinely accorded to a learning activity could be spent better on another activity. For example, the children themselves may decide that they are getting so much out of the science period that it would be worth while to extend it ten or fifteen minutes. Sometimes a teacher may see an opportunity for a learning activity that he feels is so important at the particular moment that it will be valuable to take time from scheduled activities for it. You saw this happen in Dave's class when Miss Simon took time from regular class activities to follow up the children's interest in baseball.

When children are to be allowed no real choice in the matter, it is not genuine planning but manipulation. Planning should not be a guessing game in which the teacher fishes around until some child finally suggests what the teacher wants said. Such an incident is reported by Miel et al. (1952, pp. 258, 259). Only parts of the session are reproduced here:

- | | |
|-----------|---|
| PUPIL | Let's talk about problems connected with the home. |
| TEACHER | Start with a general outline first. A discussion of problems can come last. |
| PUPIL | Start with the first types of home and then work our way up. |
| TEACHER | What are the first things we should discuss before we take up types of homes? |
| SECRETARY | How would you express it [general idea of responsibility] on the board? |
| TEACHER | Wait. What comes before responsibility? |

- CHAIRMAN What is the second suggestion?
 PUPIL Problems.
 TEACHER Let's leave a discussion of "problems" to the last.
- PUPIL Let's start with cave men and why they built homes.
 TEACHER Remember the outline. How shall we word it for the outline?
 PUPIL The reason for homes.
- PUPIL Let's discuss "What do you think of home?"
 TEACHER We're off the point.
- PUPIL We can discuss architecture, the architecture of long ago and of today.
 TEACHER What is our aim? Is it to discuss architecture?
 PUPIL Our aim is to study homes, then and now.
 TEACHER Yes, but what is our real aim?
 PUPIL How to improve the home.
 TEACHER That's right, improvement, not architecture.
- TEACHER What are the three words we think of when we use the word "comparison"?
 PUPIL Past, present, future.
 TEACHER Those weren't the words we used when we took up "schools."
 PUPIL The eighteenth, nineteenth, and twentieth centuries.
 TEACHER (to rest of group). She left something out.
 PUPIL Colonial times.
- TEACHER What shall we do first?
 PUPIL Olden times.
 TEACHER Remember our study of the school. What comes first?
 PUPIL The necessity for homes.
- TEACHER What comes first under "homes"?
 PUPIL Responsibility. Each person's responsibility in the home.
 TEACHER No. First, the history of the home. Then, the reasons for the home.

The above sequence of events differs very little from authoritative teacher planning. Instead of ordering in a declarative fashion, this teacher wheedled and prodded until the class ended up with plans exactly as she would have made them, even to the very words. Where the situation is so closely restricted that pupils can have no real choice in the matter, it seems better for the teacher to tell the children what must be done than to draw his own plans from them.

The problem to be discussed by the group should be made clear to them at the outset. During the planning session the teacher may want to raise questions, clarify or interpret the contribution of some child, add information, make con-

structive suggestions, keep the discussion on the track, and help the group to reach a decision.

Both in planning and evaluation the teacher needs to keep the climate encouraging for the widest participation. He must learn to listen, to draw out the less vocal children, to postpone a suggestion without losing it. Sometimes to have a quiet child contribute anything at all is more important than the relevance of his contribution. It helps to gather all suggestions before evaluating them so that no individual is threatened or rebuffed. Criticism and suggestion may be given and taken constructively rather than personally when the climate is free and friendly.

Usually it is best to develop long-range plans with the whole group and then let small groups and individuals work out the details of procedure. Some teachers like to involve pupils in daily planning of a schedule, while others prefer to make daily plans for some areas of study, weekly plans for some, unit plans for others, and special plans for special occasions.

Particularly in the elementary school, some teachers like to evaluate the day's achievements with the class at the end of each day. This helps children, especially the younger ones, to interpret the school and its program in their reports at home. Some teachers prefer to take stock casually and continuously as units of study and projects proceed and to evaluate more specifically when the particular work is finished.

Each experience with planning, each experience with evaluation should contribute to the group's skill and make the children more capable the next time. It may sometimes take several hours to do cooperatively what the teacher could do in a few minutes, but the gain in motivation and the growth in maturity that result when children contribute is well worth the time spent.

Individual self-evaluation

The learner needs to evaluate his own progress as well as to help the group evaluate its progress. As an individual, the learner profits most when this evaluation is made against his own capacities and accomplishments rather than in comparison with some already established norm.

Whether the teacher encourages self-evaluation or not, we can be certain that self-evaluation always goes on, even if only in a covert way. The child views his activities with pride, with approval, with distaste, with mixed emotions. He appraises himself as "pretty sharp" or "dumb" or "could do better." Sometimes this evaluation can be badly distorted—an individual may underestimate or overestimate his potentials and his realization of them. Accurate or not, this evaluation colors his feelings about himself and the things he does both individually and in groups.

The learner's appraisal of himself is affected by a number of influences: his opinion of the teacher's feelings about him, the way in which the teacher treats him—whether he is addressed in a curt voice or a pleasant one, whether he is rebuked or tolerated or encouraged—his opinion of his classmates' feelings about him, and the way in which the group treats him. All these influences play a part in shaping the learner's concept of himself.

The tendency toward self-evaluation should be encouraged and guided, for only through constructive evaluation of his efforts can the learner see where he needs to improve. Sometimes self-evaluation leads only to morbid introspection, a feeling of profound dissatisfaction, and ultimately to feelings of inferiority. Often the child needs help to see himself realistically. The criteria he uses to judge himself may be inappropriate. For this reason one of the phases of evaluation with which teachers must be concerned is helping children to evaluate their own learning in ways that will be positive and encouraging and yet realistic—ways that will lead to the improvement of future learning.

One effective way in which the individual may evaluate himself is to keep a record of his own progress and samples of his work over a period of a semester or a year. In this way he has at hand concrete evidence of his own development. It is helpful too to provide the child with a detailed self-guidance chart itemizing every point on which the teacher expects to examine him.

Another way in which a pupil can evaluate is to look for his own mistakes. When a pupil is encouraged to correct his own spelling, to proofread his own written work, to check his own math problems, he can see more clearly where he has been wrong and where he needs to improve.

Dave's experience of being coached in batting (pp. 233–234) helped him to evaluate his own baseball prowess and achieve a more realistic view of his abilities. The coach's explanation about individual differences had a wholesome effect on him. He achieved an understanding of his capacities that enabled him to see them more realistically and to play for his own enjoyment rather than for some unattainable fame.

Another effective vehicle for self-evaluation is the pupil-teacher conference. At regular intervals pupil and teacher may discuss achievement over a given period of time and plan together for improvement. Such conferences should help the pupil to realize that a good share of the responsibility for his total development rests with him. They should not become an opportunity for the teacher to lavish praise or blame for achievement or lack of it. The tone should always be positive and realistic.

There is no reason why teachers should not help pupils to gain insight into the learning process itself. It is common for many pupils to become discouraged in learning some new skill when they reach the plateau which usually follows the initial gain. This phenomenon is found in most learning situations, and it may be comforting and useful for children to know that the learning curve is never uniform in its upward progression. This is no more difficult for a reasonably mature child to understand than are many of the other concepts commonly taught in schools.

FORMAL EVALUATION PROCEDURES

The teacher guides the classroom group and the individual learners in their self-evaluation, as you have seen. But the teacher's evaluation job does not end there. He is also responsible for evaluating the learner's progress so that he may record his findings for the school and for the parents.

The more data the teacher can glean about a child, the more thorough and comprehensive will be his evaluation. Many techniques are available to the teacher to help him know a child and evaluate his accomplishments. They include standardized tests, teacher-made tests, and records.

Standardized tests

Standardized tests include tests for intelligence, achievement, personality, study skills, aptitude, and interest. These have been developed scientifically by psychologists and educators after long experimentation. The importance of standardized tests is that their measurements are more precise and often furnish more accurate information for diagnosis than do the observations of the teacher alone. Standardized intelligence tests were discussed in Chapter 10.

Achievement tests attempt to measure the knowledge and skills a person has acquired in a given area. A good achievement test will also test the degree to which he understands and applies this knowledge and will assess his ability or readiness to begin more advanced learning. Most tests which are given in the classroom for evaluation are achievement tests.

There are several widely used standardized achievement tests (*Metropolitan Achievement Tests*, *Stanford Achievement Test*, *Iowa Every-Pupil Tests of Basic Skills*, *California Achievement Tests*). Achievement tests at the elementary level are designed to measure achievement in such areas of learning as reading, grammar, spelling, history, and arithmetic. Batteries of tests have also been prepared for the high-school and college levels and include tests in the social sciences, biological and physical sciences, and humanities.

Reading tests at all levels are used extensively because of the heavy demands on reading skill necessitated by practically all academic work. Reading tests are also given for clinical purposes, as problems in reading are often related to both personality and academic problems. Some of the reading tests in common use today are the *California Reading Test*, the *Iowa Silent Reading Test*, the *Cooperative Reading Comprehension*, the analytic-type *Basic Reading Tests*. The *Durrell Analysis of Reading Difficulty* and the *Gates Reading Tests* are used primarily by clinicians for intensive diagnosis in cases of reading disability.

Achievement tests are perhaps the most useful tests for the classroom teacher. What he could learn from group personality or intelligence tests, the sensitive teacher is often aware of through observation and experience. In those special cases where he may feel that an individual test is necessary (say a personality inventory for an emotionally disturbed child or an intelligence test such as the *Stanford-Binet*), he is not qualified to give it. Most individual tests can be given only by a specially trained technician, such as a psychologist or a guidance worker.

Achievement tests generally fall into two categories. First there are *level-of-achievement tests* which show at what level a student is able to function in a variety of subjects and skills. A teacher would use this type of test at the beginning of the year to assess the range of achievement in his class so that he may divide the class into working groups.

Second there are *qualitative achievement tests*. Once the teacher has determined range of achievement, he will find these tests helpful to show the breadth and depth of each child's understandings and skills in a particular subject. He may want to use qualitative tests for each subject to pretest a child's proficiency early in the year and then periodic progress tests during the year to see how the child is advancing.

To see more clearly how the two types of tests differ, take the skill of reading, for example. A level-of-achievement test may show that Johnny is capable of reading material at the normal second-grade level of difficulty. But such a test will not show how well he understands what he has read nor whether he has developed equal facility in all of the reading skills.

A qualitative test, on the other hand, may show not only that Johnny is capable of reading at the second-grade level, but also where his reading strengths and weaknesses lie. He may be adept at using phonetic analysis, applying word-attack skills and structural analysis, identifying similar meanings, and understanding sentences, and yet be weak at recognizing cause-and-effect relationships and understanding implied meanings. This tells the teacher exactly where Johnny needs help. Examples of both types of tests are shown on pages 494-497.

It is obvious that a teacher can get a great deal of valuable help from achievement tests in determining at what point he should begin developing ideas and skills and in choosing learning materials of a suitable range of difficulty. If a tenth-grade teacher finds that some of his students are reading at the sixth-grade level, he will know he cannot depend on a single text written at the tenth-grade reading level. At the elementary level, a teacher will not try to teach long division if achievement tests have shown that his pupils add poorly and cannot subtract. As you have seen in earlier chapters, teacher expectations that are out of gear with the readiness of a group lead to frustration all around.

When an individual's test results are preserved systematically throughout his school career, they furnish evidence of the pattern of his growth. You will recall from Chapter 3 that Olson, in his studies of growth, identified school achievement as an important index of the total growth of an individual.

The attempt to measure quantitatively such factors as attitudes, interests, and various other personality attributes is more recent in the history of educational measurement than is the measurement of academic achievement. Perhaps this is due in part to the fact that, traditionally, schools have been preoccupied with achievement and have paid much less heed to other aspects of the individual's development. It is probably linked also to the belief that measurement of the so-called intangibles of personality is more difficult than the measurement of achievement.

Even though the measurement of personality components may be difficult, a modern school which is concerned with contributing to the growth of children can scarcely dismiss it. Competent teachers are concerned with personality traits of their pupils and they *do* make some assessment of them. Their efforts to assess personality development will be more systematic and more reliable if, instead of random observation and generalization, they use data from one or more of the standardized instruments for measurement of personality which are available. The data which these tests yield will then become part of the total evidence available for a continuing program of evaluation.

Items from the BASIC READING TEST

On these four pages are items from two different types of achievement tests. The *Basic Reading Test* is a qualitative achievement test designed to yield information on a child's degree of mastery of specific skills. There is a separate battery to follow each reader in the elementary grades. Each one has seven or eight subtests designed to show strengths and weaknesses in the component skills that go to make up "reading." The items shown here are from the test for the first half of the third grade.

In the sample profile shown, the broken line indicates the 25th percentile on each subtest. That is, 75 per cent of the children on whom this test was standardized made scores above this line. The solid line indicates the reading achievement of an individual child whose total score placed her at the 35th percentile. Looking at the profile, the teacher can identify the areas in which this child's difficulties lie, and can plan means of helping her overcome them.

I. COMPREHENDING SENTENCE MEANING

Directions (oral): In each box read the sentence and the three lines below it. Decide which of the three lines best tells what is meant by the underlined part of the sentence and draw a line under it.

"That pony is the cream of the crop," said Mr. Ball proudly.

the best little horse I have
the one that is yellowish-white
the best eater of all

II. FORMING SENSORY IMAGES

Directions (oral): In each box read the paragraph, and then read the questions and answer each one by drawing a line under *Yes* or *No*.

When Katy saw the huge snowdrifts, she put another log on the roaring fire. Then she walked over to the radio and tuned in the news and weather.

Was the snow in uneven piles?

Yes No

Was the fire burning silently?

Yes No

Did Katy see the man giving the news?

Yes No

V. SCRUTINY—CONTEXT

Directions (oral): In each box on this page you are to read the incomplete sentence and the three words below it, and then draw a line under the word that completes the sentence correctly. After you have underlined a word, read the sentence to yourself, using the word you underlined, to be sure the sentence is a sensible one.

Jack dreamed he was a _____.

polite pilot plate

VI. PHONETIC ANALYSIS

Directions (oral): In each box on this page you are to read the sentence, say the underlined word to yourself, and decide which syllable of the word is accented. Then read the three words below the sentence and draw a line under the one that has the same vowel sound as the accented syllable of the underlined word.

Tim said, "Approach the bridge slowly because the road is full of holes."

hot hope or

VIII. DICTIONARY SKILLS

Directions (oral): In each box read the word and its numbered definitions. Then read the two sentences below the definitions and decide which of the meanings the word has in each sentence and write the correct numerals on the dotted lines.

vacuum 1 space from which almost all air or gas has been removed. 2 clean with a vacuum cleaner. 3 vacuum cleaner.

_____ The vacuum wouldn't clean the rug because Susan had not connected it.

_____ The boys watched as the science teacher made a vacuum in the test tube.

INDIVIDUAL PROFILE

Sentence Meaning	Sensory Images	Emotional Reactions	Relationships	Scrutiny - Context	Phonetic Analysis	Structural Analysis	Dictionary Skills
11	11	14	14	11	13	11	15
10	10	13	13	10	12	10	14
9	9	12	12	9	11	9	13
8	8	11	11	8	10	8	12
7	7	10	10	7	9	7	11
6	6	9	9	6	8	6	10
5	5	8	8	5	7	5	9
4	4	7	7	4	6	4	8
3	3	6	6	3	5	3	7
2	2	5	5	2	4	2	6
1	1	4	4	1	3	1	5
0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.6

Items from the STANFORD ACHIEVEMENT TEST

The *Stanford Achievement Test* is a level-of-achievement test containing subtests in eight areas. The items shown here are from the Primary II battery, Form X. The profile can be interpreted to show the grade level at which a given pupil can be expected to perform (a stanine of 5 indicates the median performance of the group on which the test was standardized). The profile shown here is that of a girl who is above average in intelligence. You can see that she does better-than-average work in nearly every area but is comparatively weak in her grasp of arithmetic concepts.

TEST 1: WORD MEANING

Directions: Draw a line through the answer that makes the sentence true. Look at all four answers and choose the *best* one.

To drive a nail into a piece of wood, you should have a			
hammer	bottle	boat	ladder
To gaze is to			
eat	touch	listen to	look at

TEST 2: PARAGRAPH MEANING

Directions: Find the one word or phrase that belongs in each space, and draw a line through the word or phrase. Do *not* write in the spaces.

Jim's father is bigger and older than Jim. But Jim's baby brother is <u>8</u> and <u>9</u> than Jim.			
8 fatter	taller	smaller	larger
9 older	younger	cuter	fairer

TEST 7: ARITHMETIC COMPUTATION

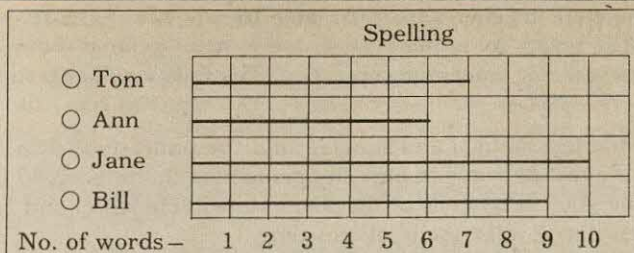
Directions: Look at each example carefully to see what you are to do. Find the answer for each example. Work quickly but try not to make errors.

$$11 - \square = 4$$

$$195 + 6 = \underline{\hspace{2cm}}$$

TEST 8: ARITHMETIC CONCEPTS (Numbers and Measures)

Directions (oral): Look at the chart. It shows the number of words spelled correctly by Tom, Ann, Jane, and Bill. Make a cross in the circle before the name of the pupil who spelled the *fewest* words correctly.

**TEST 8: ARITHMETIC CONCEPTS**

(Problem Solving)

Directions (oral): Find the correct answer from among those given below the example. Put a cross through the circle beside the right answer. If you need it, you may use scratch paper to figure on.

David gives his dog 2 biscuits each day. How many biscuits does his dog get in one week? Make a cross in the circle before the number.

☐ 2 ☐ 7 ☐ 12 ☐ 14

PUPIL STANINE PROFILE

	GRADE SCORE	%-ILE RANK	STANINE								
Word meaning	57	96	1	2	3	4	5	6	7	8	9
Paragraph meaning	64	96	1	2	3	4	5	6	7	8	9
Science & social studies concepts	48	80	1	2	3	4	5	6	7	8	9
Spelling	57	96	1	2	3	4	5	6	7	8	9
Word study skills	70	94	1	2	3	4	5	6	7	8	9
Language	58	90	1	2	3	4	5	6	7	8	9
Arithmetic computation	41	84	1	2	3	4	5	6	7	8	9
Arithmetic concepts	33	42	1	2	3	4	5	6	7	8	9

Any competent teacher should be able to administer, score, and interpret group tests. The ability to do this is regarded in many schools today as one of the minimum essentials of teacher competence. The following suggestions may help you:

1. Read the test manual and study it until you understand it thoroughly. The reliability of the test depends in part on maintaining the prescribed conditions.
2. Provide good conditions in the room—good ventilation and light, comfortable writing surfaces, a minimum of crowding.
3. Keep the atmosphere of the class as free from tension as possible. Tension on your part will be transmitted to the children.
4. Read the directions to the group slowly and clearly so that all in the group will understand what they are to do. Pay particular attention to the practice exercises if any are given at the beginning of the test.
5. If you are giving a timed test, be certain that you keep time accurately, starting the whole group off at the same time and ending promptly. The accuracy of the results depends heavily on this.
6. Score the papers in strict accordance with directions given in the manual. Recheck for accuracy of scoring.
7. You will always need to exercise caution in interpreting test results. Try to be aware of fear, illness, lack of motivation, or other factors which may interfere with a student's ability to function at his best level of performance.

Another caution concerns the need for knowing exactly what a test measures. The label or title of the test may be misleading. For example, in the 1930's, "science" tests seemed to establish the fact that laboratory experience in science courses was of no advantage: students *without* laboratory experience scored as well as those with it. However, when the tests were analyzed, it was found that only knowledge of fact was being called for. The skills and attitudes that a laboratory experience can teach were not represented in the test items. With tests devised to measure the special proficiencies that can grow out of laboratory instruction, quite different results have been found (Kruglak and Carlson, 1953).⁵

In the same way, two tests labeled "geography achievement tests" might call for very different kinds of achievement—one, perhaps, for an encyclopedic knowledge of capital cities, principal industries, and locations of rivers and mountains, and the other, perhaps, for an understanding of the relationship between physical resources and the development of particular social and economic patterns.

The great advantage of standardized tests is that they are relatively precise in their measurement and provide standard norms against which a learner's performance can be compared. The development of standard tests, therefore, has made possible the collection of data which are more trustworthy for evaluation than teachers have ever had before. But the dependability of a test is always limited by its degree of *validity* and *reliability*.

⁵Principles for constructing various kinds of achievement tests are discussed in Chapter 3 of *Measuring Pupil Achievement and Aptitude* by C. M. Lindvall (New York: Harcourt, Brace & World, 1967).

Validity A test is *valid* if it actually serves the purpose it was designed to serve. Thus, validity means somewhat different things for different kinds of tests.

In measuring *school achievement*, for example, a valid test must sample the knowledge, skills, and so on that the teacher wishes to evaluate. The science tests described above are a case in point. They did not provide a valid measure of laboratory learning.

The validity of an *aptitude* test, on the other hand, will depend on whether it makes possible an accurate prediction of the future achievement of a student. Here the validity of the test is determined by comparing the actual achievement of students with the predictions which were originally made on the basis of data from the test. If the test is high in validity there will be a close relation between the original predictions and the actual outcomes.

In *personality* tests, validity means that the data from the test give an accurate picture of the traits that make up a person's personality structure. Here validity can be assessed only by comparing results from the test with data secured from other sources whose validity has already been established.

These interpretations of validity refer to whole tests. The concept may also be applied to the separate items that make up a test. A valid *test item* is one which discriminates between good and poor students. In the case of an achievement test an item may lack validity because it is too easy—that is, everyone will get it right—or because it is too hard and nobody gets it right. In either case, the item is useless because it makes no discrimination and we learn nothing from it.

We may say, then, that a valid test is one which actually does what it is supposed to do, and a valid test item is an item which discriminates among those who take the test.

Reliability A test is *reliable* when it does *consistently* whatever it does. This means that a test with high reliability can be used by a number of investigators on different occasions and the results from each administration of the test will be consonant with the results from other administrations. A reliable test, therefore, is dependable and is relatively free from gross errors of measurement. An unreliable test would be something like a rubber tape measure. It would yield one measurement one day and another measurement the next. We could not depend on any reading we got from it.

It is possible for a test to be reliable and still not be valid. But a highly valid test will also be highly reliable. For a test to be useful in educational measurement and evaluation, it must meet the criteria of both validity and reliability.

Leading publishers of standard tests pay careful attention to these characteristics of their tests and regularly supply information about the degree of reliability and validity of a given test in the test manual. This information is usually given in coefficients. The higher the coefficient, the more valid or reliable the test. As a rule, coefficients of validity tend to be lower than coefficients of reliability. Often the publisher also supplies the standard error of the test. The smaller this error, the more reliable the test.⁶

⁶These concepts and other facets of classroom testing are discussed in Chapter 3 of *Educational Measurement* by Richard H. Lindeman (Glenview, Ill.: Scott, Foresman, 1967). A brief but comprehensive reference source on the use of standard tests in school evaluation is *Understanding Testing* (Office of Education, 1960).

Teacher-made tests

Teacher-made tests can play a constructive and valuable part in a program of evaluation depending on how they are made, used, and interpreted. They are essentially achievement tests seeking to measure what the student has learned from a particular experience.

You are no doubt familiar with the usual types of informal tests, since you have taken many of them in your educational career. They fall roughly into one of two categories: essay examinations and objective examinations. Both have their merits and their drawbacks.

Essay examinations are used widely at the secondary and college levels and somewhat less at the upper elementary level. Their use is largely precluded at the early elementary levels because children have not at that point mastered the art of composition. Essay tests can be used in practically any subject-matter field, although the form of the questions necessarily will vary with the material involved.

The essay examination tests your ability to organize and interpret what you have learned. It requires not only that you be able to memorize details but that you be able to see meanings and apply principles to other situations.

The greatest weakness of the essay test lies in the difficulty of scoring it objectively. Every campus abounds with legends of the inequalities of scoring on essay examinations by different professors on the faculty. As early as 1912, a study (Starch and Elliott) was reported in which 142 English teachers were asked to mark the same paper obtained in an English class. The marks awarded by these teachers ranged from 50 to 92 per cent—all the way from failure to near perfection. The only conclusion it seems possible to derive from such facts is that these teachers marked the papers in terms of their own particular values and expectations. Their judgments seemed to be clearly regulated by subjective factors.

Another drawback of the essay examination is its tendency toward general questions, so that students are often without adequate clues as to the type of response desired by the teacher. Also, the scoring of essay examinations can be slow.

The objective, or short-answer, examination is apt to test your knowledge of facts, rather than your ability to organize and interpret. Its questions can be answered by only a word or by indicating a response in the form of a symbol. Some of the devices used are true-false, completion, multiple-choice, and matching.

The short-answer test is quick and fairly easy to score objectively. Its greatest weakness lies in the difficulty of using it to measure any achievement other than the number of facts acquired. Some psychologists criticize dependence on objective tests on the grounds that they contain only recognition items and do not demonstrate a student's growth in ability to analyze, synthesize, and develop original ideas (Meyers, 1960).

Much work has been done in recent years to show that the objectivity of the short-answer test can be combined with the depth of the essay test. Care in construction is the key factor. The short-answer form is used, but the questions are so constructed as to test for reasoning ability and understanding and application of principles. A test so constructed overcomes the faults found in most short-answer examinations.

Care in construction and scoring can do much to correct the weak points of the essay examination, too. Questions can be made specific so that the student understands just what the instructor has in mind. Scoring can be made more objective if it follows a list of criteria.

Regardless of the type of test used, a teacher needs to plan it in terms of his particular objectives for this group of students. If one of his objectives was to improve critical thinking, he needs to be sure that some of his test items call for critical thinking so that he can appraise the progress his students are making in this skill. Because knowledge-of-fact questions are easier to write than questions that draw on other learning outcomes, achievement tests, both standardized and teacher made, often are overly weighted for this one outcome and do not give students an adequate opportunity to demonstrate other learning that they have achieved.

When teacher-made tests are used as diagnostic aids for the improvement of the teaching-learning process, they do not necessarily lead to the harmful effects often claimed for them. Their influence is usually most unfavorable when they are used as the sole basis for awarding final grades or when they are used as goads to force students to study.

It would be impossible to standardize teacher-made tests for all the specific situations in which they function. Teacher-made tests measure what learning has taken place in a particular learning situation unique in itself, due to the particular personality of the teacher, the particular make-up of the group, the particular setting, and the particular atmosphere. The fact that the tests the teacher devises are not standardized should make him especially alert to clues as to their validity and reliability, but it in no way nullifies their value. They fulfill their own important function in the evaluation process.

Keeping school records

The teacher's evaluation for the school usually takes the form of a permanent record folder for each child. Into these folders go information gathered from standardized personality inventories and achievement tests, observations about the child that the teacher feels to be revealing, and an account of the child's performance on schoolwork. These folders, passed on with each child from grade to grade, are invaluable in giving the current teacher a better understanding of the child and in helping each new teacher to become acquainted with him. They are one means of providing that each child's learning will be continuous and sequential.

The teacher may also use anecdotal records and curriculum record logs to gather data for evaluation. *Anecdotal records* or *behavior journals*—the terms are interchangeable—constitute a type of clinical data which teachers are finding highly valuable in evaluation. The idea of a behavior journal is simple but the techniques involved are difficult and require training and practice.⁷ A behavior

⁷A group technique for interpreting such records is described in Chapter 13 of *The Child in the Educative Process*, by D. Prescott (New York: McGraw-Hill, 1957).

journal provides for the recording of significant episodes in the life of a child, significant in the sense that they give information about the forces and situations in the environment which are affecting his development.

Many students of the field feel that a well-kept behavior journal furnishes data that cannot be gathered through usual testing instruments. Olson states:

When the purposes of schools are viewed in terms of contributions to the total growth of the child, it becomes apparent that attention solely to the physical and intellectual objectives is inadequate. The more subtle individual, social, and emotional relationships are also important. While standardized measures and projective methods are available and useful for certain problems in this area, it remains true that only an unstandardized, flexible, recording plan can hope to capture revealing samples of behavior from the life situations of a child. (1948, p. 1)

An important matter in keeping a behavior journal is to report factual material *unmixed with the personal reactions of the recorder*. The following anecdotes from the record of a fifth-grade boy exemplify the way such anecdotes should be written (Dinkmeyer, 1965).

Oct. 21, 1964, 2:00 p.m.

We were working on a project involving study of the midwestern states. Jack had volunteered to bring the necessary maps from his father's gas station. He said he had forgotten them, but would pick them up today after school. The class agreed that anyone could forget and deferred this part of the project until tomorrow morning. W. S.

Oct. 22, 1964, 11:00 a.m.

Jack did not bring the maps. He said, "The ball game lasted longer than I had thought, and there wasn't time to go to the station." Since we could no longer delay, Bill offered to pick them up over the noon hour. W. S.

Note that the teacher described the situation in which the behavior took place and reported Jack's words and actions, but that he did not attempt to draw any conclusions as to Jack's dependability. Note also that the entries are dated and signed with the teacher's initials—information that may be helpful to Jack's future teachers as they read through his records in years to come.

A form that is often used for such a journal is a page divided into two parts. The left-hand column is for accurate, objective recording of incidents which occur. The right-hand column is for explanations, judgments, recommendations, and the like, by the person recording the incident. Other information included is the child's name and birth date, the names and occupations of his parents, the teacher's name, and miscellaneous serviceable items from school records and other sources, such as intelligence quotient, personality or achievement scores, and data on family conditions.

Naturally, a behavior journal becomes most valuable when it accumulates over the years of a child's life in school and indicates a history of the forces which have affected his development. For this reason, there is a growing

feeling in schools that the behavior journal is an important part of the cumulative record of development for each child that should begin when he enters school and should follow him throughout the period of his school attendance.

Another type of anecdotal recording which can furnish data for the evaluation of learning is the *curriculum record log*. This will be mentioned only briefly since a full treatment belongs in a book on curriculum rather than in one on educational psychology. In this type of record the teacher keeps a journal of the educational activities which he has developed with his group. It frequently includes a brief account of the classroom activities, the materials used, and the children's reactions to the various aspects of the program.

When material of this kind is accumulated over a period of years, it furnishes valuable information needed to provide continuity in learning experiences. Its chief worth in evaluation is to assist teachers in judging the appropriateness of various kinds of materials and activities for a specific group of learners.

A teacher will not be able to obtain in every situation all the kinds of information discussed in this chapter. However, he should realize the importance of obtaining as much information as possible. Human learning is infinitely complex and varied, and any program of evaluation of learning must of necessity involve evidence from all aspects of the child's life in school. We have not attempted to discuss here all the factors in evaluation, but we have introduced the most common.

REPORTING TO PARENTS

Reporting to parents on students' progress has been a controversial topic for many years. Conventional report cards have been attacked periodically, sometimes by educators, very often by students, and sometimes even by the public. Some critics have on occasion gone so far as to advocate elimination of all evaluation reports, regardless of the form used. Usually the argument has been that evaluation reports ruin the sensitive child and place a stigma on the academically slow child.

As a matter of fact, students may often be the first to protest such an extreme policy. It gives them psychological security to know where they stand. Parents, too, want to know about the progress their children are making in various aspects of the school program, and it would seem they have a right to such information.

It is true that evaluative reports can be destructive to a student's morale, but they need not be if they are designed to inform and diagnose rather than merely rate. Many school systems are working continuously to find better ways of reporting to parents than is possible with the traditional "A" to "F" scale that usually ranks a student against an idealized standard and in competition with his classmates.

One method that has been tried many times is the "Satisfactory/Unsatisfactory" system in which the teacher is asked to rate a pupil's achievement against his capacity to achieve. Thus, a student with high achievement potential might be rated "unsatisfactory" in some area if, in the teacher's judgment, he was capable of doing better. Actually his achievement in the absolute

PROGRESS IN SKILLS

Children in the Continuous Development Program are assigned to levels in both reading and mathematics. Pupils will progress from level to level at any time during the school year according to their individual rates of development. Thus, pupils will be measured according to their own achievements and should not be compared with other children.

READING

LEVEL	
A	Readiness
B	Pre-Primers
C	Primer
D	First Reader
E	Second Reader, Part One
F	Second Reader, Part Two
G	Third Reader, Part One
H	Third Reader, Part Two

MATHEMATICS

LEVEL	
A	Readiness
B	Basic Number Concepts

REPORTING CO

ACHIEVEMENT

The letter represents the degree to which your child has met the broad standards of the level:

E — Excellent

G — Good

F — Fair

U — Unsatisfactory

A check (✓) indicates a need for improvement in an area not to be reported at this time.

READING

Level	
	Recognizes words
	Understands what he reads
	Locates and uses information
	Appreciates good literature

MATHEMATICS

Level	
	Understands concepts
	Uses number operations efficiently
	Reasons well in solving problems

Name _____

Letter grades in the following subject areas are cumulative

	10th Week	20th Week	30th Week	40th Week
LISTENING				
Comprehends what he hears				
Interprets what he hears				
SPEAKING				
Expresses ideas well				
Speaks clearly and distinctly				
WRITING				
Writes effectively for practical purposes				
Writes creatively				
Uses fundamental skills correctly				
Writes legibly				
SPELLING				
Learns assigned spelling words				
Spells correctly in written work				
SCIENCE				
Understands basic concepts				
Applies understandings in solving problems				
SOCIAL STUDIES				
Acquires basic understandings				
Develops map, globe, and related skills				
ART				
MUSIC				
PHYSICAL EDUCATION				

SPECIAL ABILITIES, INTERESTS, AND SERVICES

PROGRESS IN SCHOOL SUBJECTS									
Periods									
	1	2	3	4	1	2	3	4	
LANGUAGE ARTS									
Reading and Literature									
Progress in silent reading									
Progress in oral reading									
Understanding of material read									
Growth in vocabulary									
Voluntary reading on a									
Handwriting									
Progress in writing habits									
Formation of letters									
Legibility in all written									
English									
Oral expression									
Written expression									
Correct usage									
Spelling									
Growth in use of basic (daily assignment)									
Spelling in all written work									
MATHEMATICS									
Use of basic facts and principles									
Accuracy									
Reasoning									
SCIENCE									
Growth in scientific attitude									
Growth in understanding									
Organization and interpretation									
Contributions to class (reports, collections, articles of interest)									
SOCIAL STUDIES									
Growth in the understanding of relationships									
Selection of materials (from reliable sources, etc.)									
Organization and interpretation									
Contribution to class (reports, collections, articles of interest)									
Participation in group activities									

PROGRESS IN SPECIAL AREAS									
Periods									
	1	2	3	4	1	2	3	4	
FRENCH									
Interest and Effort									
Comprehension									
Speaking Skill									
Reading and Writing Skills									
TYPING									
Attitude									
Speed									
Accuracy									
MUSIC-Vocal									
Interest and Effort									
Creative Expression									
Group Participation									
SPEECH and DRAMATIC									
Voice and Articulation									
Creative Expression									
Application of Communication									
Group Participation									
Interest and Effort									
INDUSTRIAL ARTS									
Demonstrates									
Understanding of basic industrial processes									
Ability to solve construction problems									
Ability to select and use available material efficiently									
Effective use of time									
Interest and effort									
FINE ARTS									

PHYSICAL EDUCATION				
	1	2	3	4

KEY TO MARKING	
A Outstanding Achievement	E Excellent
B Above Average	S Satisfactory
C Average	X Effort needed
D Below Average	
F Failure	

A check (✓) following any of the items shows need for improvement. No check indicates normal progress or better.

PERSONAL QUALITIES				
	Quarters			
	1	2	3	4
1. HEALTH The observance of simple health rules				
2. INDUSTRY Giving steady attention to work				
3. COURTESY Consideration of others				
4. ACCURACY The use of careful methods of work				
5. COOPERATION Working well with others				
6. SELF-DIRECTION Finding worthwhile things to do				
7. ACCEPTANCE OF RESPONSIBILITY				
8. GOOD SPORTSMANSHIP				
9. RESPECT FOR PROPERTY				

These three pages contain examples of some of the many kinds of report cards in use today. The form shown on the opposite page is used in the primary grades of the Chicago Public Schools. Notice that children are assigned to "levels" rather than "grades" in reading and arithmetic and may progress from one level to the next at any time during the year.

Reproduced above are three pages of the six-page progress report used for junior-high pupils at the Demonstration School of the National College of Education in Evanston, Illinois. Besides receiving an overall grade in each subject-matter area, the pupil is assessed on his performance in the various component abilities.

[illegible]

At the top of the page are sheets from the "course book" that forms a continuous progress report for a Chicago high-school student. At the end of each semester, one copy of the student's grades is removed and filed; another copy remains in the booklet, which the student retains upon graduation. The form at the bottom is part of a five-copy pad used by a suburban school system.

sense might be far better than that of another student who would be marked "satisfactory" by the teacher because this student had done as much as the teacher thought he could.

On the face of it, this kind of procedure has looked attractive to many people. However, there is a basic difficulty in it. Rating with respect to ability presupposes that the teacher has accurate knowledge of a student's true potential. Probably the most commonly used index of potential is the IQ. But we have already seen in earlier chapters of this book that the accuracy of IQ measurements may be questionable in some instances.

Furthermore, school achievement is a function of various factors and while that which is measured by intelligence tests certainly is important, it is far from being the whole story. A youngster's "unsatisfactory" performance may not indicate poor use of potential but rather personality or environmental problems which are beyond his control. Considerations of this kind cast doubt on the wisdom of a policy of strict rating of pupils in terms of their presumed ability to achieve.

It is a sound principle to evaluate the progress and the prospects of a student in terms of his own achievements, talents, and interests. But in this instance, evaluation is a part of the learning process. It is a kind of "feedback" that is useful in forwarding the learning of the student. This is a very different matter from that in which the teacher makes an arbitrary "satisfactory" or "unsatisfactory" judgment in a situation for which there is insufficient evidence.

A type of report that obviates some of the unfavorable aspects of single overall rating is a written progress report. There are many variations and it is common for a school system to develop a written report form that will carry through its own idea of evaluation and at the same time will meet the wishes of parents. Sometimes these forms will include detailed check lists of every item on which the pupil is being evaluated. More often than not, space will be provided for explanatory comments by the teacher.

Attention sometimes has been called to certain problems involved in the use of check lists as a means of reporting to parents. The chief difficulty lies in lack of precise evidence on which the teacher bases the generalization expressed by the check mark. Sometimes when teachers have been challenged to defend their judgment, they have been unable to produce sufficient evidence to do it.

There is evidence that parents like to get both written and oral reports on their children's progress. In a survey conducted by the Research Division of the National Education Association (1961) it was found that more than three fourths of the elementary schools in the survey used some combination of parent conferences and report cards. At the junior high school level, half the districts used a combination plan. Two fifths of the high schools used both conferences and reports. Even at the elementary level, reporting by means of conferences alone is rare (less than 1 per cent in the NEA survey) but the number of elementary schools using only the traditional type of report card is diminishing. At the senior high school level the situation is different. Report cards alone are used by 60 per cent of these schools.

There is wide agreement that parent-teacher conferences can be highly useful to both home and school in assessing progress and working with problems,

exchanging information, and establishing closer home-school relationships at all grade levels. In some high school relationships at all grade levels. In some high schools where parent conferences are part of the procedure, the student may be included in the conference.

Because the child is in a different setting at school from that at home, the teacher may see facets of the child's personality and character that are not obvious to the parents. The reverse also is true. Teachers can supply parents with information about the child's school behavior that may indicate need for improvement in the child-parent relationship. Parents, on the other hand, can supply a teacher with information about the child's background and reactions to school that may help him assess the child's readiness level and understand his particular problems. The child benefits most when teacher and parents have a mutual interest in his development.

There are several things the teacher can do to contribute to the effectiveness of conferences with parents. The setting is important. The conference should be held in a place where both parents and teacher can relax, and where privacy can be maintained.

Regularly scheduled conferences provide a valuable opportunity for an interchange of information between parents and teachers. The teacher should make it a point to become acquainted with the parents of her pupils under relaxed circumstances, rather than calling in parents only when trouble starts and tensions are running high on both sides. An excellent way for parents and teachers to get acquainted is the evening open house where parents are invited to visit classrooms, see samples of the children's work, and perhaps even "attend class" to learn about the new math or other phases of the modern curriculum.



The teacher can prepare for the conference by drawing up a check list on the child. This keeps the focus of the discussion on the child, increases the teacher's confidence, reduces repetition, keeps the conference moving smoothly, and gives the parents a tangible record to take away with them. Going over notes of the previous conference provides a starting place for the teacher and gives the parents a feeling of progress. Examples of the child's best and poorest work will help to illustrate his strengths and weaknesses.

Throughout the conference, which usually need not last more than twenty minutes, the teacher should strive to maintain an air of friendliness. Parents seek above all to know something good about their child. Bringing in his strongest attributes and accomplishments early in the talk will cushion less complimentary information. After reviewing the child's work the teacher can invite parental reactions. His role should be one of analyst rather than adviser.

To keep the note on progress, he can inform the parents of his plans for future learning activities and of ways in which he hopes to help their child. He should encourage the parents to make definite plans for ways in which they too can help. After the conference, the teacher can jot down notes of value from what the parents have said to add to the child's permanent record folder. Both in making written reports and in talking with parents, the teacher needs to take care to prevent misunderstanding.

Some teachers make use of cooperative procedures to keep parents informed. They have their students prepare a group report of current class activities, emphasizing the learning that they are achieving. The report is then duplicated and copies are carried home by the children.

THE TEACHER IS EVALUATED

In any evaluation of learning, not only is the child evaluated, but the teacher is too. In Chapter 1 we talked about what traits children value in a teacher. The two other parties who have a stake in learning—the school administration and the public as a whole—are also constantly evaluating the teacher.

Society's stake in the education of the young is primary and deep. Upon each new generation depends the furtherance of those values society holds important. For this reason the public sponsors schools. The problem of whether or not its young people are learning these values is of vital importance to the public and results in a continual surveillance of schools and what they are doing.

The teacher's behavior does affect how pupils learn. His personality, his philosophy, his ways of handling the pupils, his ways of instructing, all enter into the learning process and help to determine its direction and quality. But the evaluation of teaching is exceedingly difficult. There are many variables involved and some of the most important elements are so subtle that they elude efforts at objective measurement.

A great deal of time and energy has been expended to find ways to appraise teaching competence and to identify the factors that enter into it. Various kinds of observation schedules, inventories, and check lists have been devised, but there is an underlying feeling of doubt within the profession about the accuracy and

adequacy of current evaluation techniques (NEA, 1964b). This feeling apparently is shared by teachers and administrators alike.

Nevertheless, the quality of teaching is so important in modern society that it is impossible for educators to ignore it, even if they are not completely satisfied with the present level of evaluation procedures. The most common kind of appraisal activity is the visit of a principal, supervisor, or other administrative officer to a classroom to watch a teacher at work (NEA, 1965). It is a common, but not universal, practice for the observer to have a conference with the teacher following the visit. Other elements that are often taken into account (listed in decreasing order of frequency) are: impressions of the teacher gained from contacts outside the classroom, observations of the teacher's contacts with pupils outside the classroom, studies of pupils' achievement records, and reports of what parents and other teachers say about the teacher who is being evaluated. In some school systems in which written evaluations are made, the teacher is asked to make a self-evaluation. According to the 1965 NEA survey, only a minority of school systems (19.2 per cent) use this technique.

It would be desirable to think that in our schools today teachers are evaluated with respect to the criterion of helping students achieve maturity. Unfortunately, the empirical data now available do not support such a belief. However, work in this difficult area of appraisal is going on and it is to be hoped that the profession will eventually develop more inclusive and discriminating techniques of appraising teaching.

The public is critical

The things parents want their children to learn in school seem to correspond with our conception of the requirements of maturity. Yet parents and society as a whole often forget that the school should be evaluated against the scale of maturity. Too often criticism and judgment are made not on the basis of how well the schools are preparing all students to take a responsible place in society, but on the basis of how well they are preparing them to pass college entrance exams or teaching them a trade.

The public needs help in making its evaluation a sound one, in recognizing that it is not the school itself but school problems that require attack, and in realizing that the community as well as the school has a responsibility for solving them.

Public evaluation of a school can be destructive, based on hearsay and prejudice, and thoroughly demoralizing to teachers and pupils alike.⁸ Or it can be positive, encouraging, and helpful in improving opportunities for learning. So that it may be the latter, it becomes an important part of the teacher's job to help the public evaluate. The teacher is best qualified to understand school problems and interpret them to the public.

⁸Recent public pressure on the schools has included the demand for a tougher academic program and more rigid promotion policies. For an evaluation of "achieve or fail" policies, see "The Effect of Promotion Policy on Academic Achievement" by G. T. Kowitz and C. M. Armstrong (*Elementary School Journal*, 1961, 61, 435-443).

In recent years, school systems have increased their efforts to improve relations with the public. Some of the ways in which teachers can keep the public informed have already been discussed. These were: cooperative evaluation of each day's activities so that pupils had a clear picture of what they had accomplished and could carry it home with them, letters and special reports to parents, and parent-teacher conferences.

Schools can maintain a feeling of good will if they extend a standing invitation to parents and others in the community to visit classrooms in session. It is generally best if schools with this policy restrict visiting to one or two days a week and to three or four visitors at a time.

Persons from the community, whether or not they have children in school, can often participate in the class activities when they have special services to offer. One father whose hobby was birds talked to a third grade about them and took the class on a bird-watching expedition. A mother, a church organist, explained and demonstrated her instrument for a group of fifth-graders. Such activities not only bring the public closer to the schools, but enrich the learning of the children.

Some schools hold regular meetings at which parents are invited to meet with the teachers to discuss the welfare of their children. In some communities a citizens' committee serves as a liaison between the schools and the community. In one such community, when a school matter comes up that seems to deserve public consideration, it is made the subject of a public meeting. The school can also keep the public informed through newspapers and radio or TV reports.

The administration evaluates

It is the job of the school administration to help society understand the schools and to attempt to bring educators' thinking and public thinking together. The administration bears the brunt of society's scrutiny and must answer for the performance of individual teachers. This gives added impetus to the administration's regular evaluation of each teacher.

The most common reasons given by administrators for teacher evaluation are: improvement of instruction, decisions regarding the retention of probationary teachers, assignment and transfer of teachers, and approval of salary increments.

We have already considered the means administrators use most often in conducting appraisals. The evidence shows that over the country probationary teachers are more apt to be evaluated than teachers with continuing contracts, elementary teachers are more likely to be evaluated than are secondary teachers, and large school systems have formal evaluation procedures in greater proportion than do smaller systems.

A trend is developing to incorporate teachers into the process of devising and implementing programs of appraisal (NEA, 1964a). Nearly half of our large school systems make some provision for teacher participation in evaluation procedures and it seems more than likely that this practice will grow.

When the administration alone sets overall evaluation policy within which teachers must operate, it is not always possible for a teacher to carry out the sort of program that he believes will be most beneficial to the student. With an ex-

tremely rigid administration, he may find it difficult to put his knowledge and convictions into practice, as Mr. Roth did (p. 356). Yet there are ways in which he can succeed even under a severe handicap. Some cooperative planning and evaluation are possible within the most inflexible curriculum. Where parental visits and conferences are not the regular practice, the teacher can encourage them. He can also supplement rigid report cards with personal letters and reports.

MATURITY: THE GOAL OF EDUCATION

This book has been organized around the idea that in its broadest sense becoming educated is the achieving of maturity. Teaching is the process by which the immature child is helped to grow to increasing levels of maturity, and ultimately to achieve the mature status and responsible participation that will be expected of him when he reaches adulthood.

A really adequate program of evaluation must involve assessment of all the factors that contribute to the growth of children. It will be concerned with the physical growth of the pupil. It will involve measurement and evaluation of achievement in the various fields of the curriculum. Growth in ability to solve problems and apply learning to new situations will be a major consideration.

Over and beyond these things there is another concern, and that is the way children feel about what they do and learn in school. Essentially students must be convinced of the importance of what they do. When they believe in the importance of a goal, they will not resent the processes that are necessary for achievement. Most boys will practice football hour after hour to master the necessary skill. So it is not practice as such that they resent. They will read, though perhaps only the school paper's gossip column. So it is not reading per se to which they object. A boy will spend hours trying to figure out the trouble with his car. He does not object to reasoning in itself.

But if the teacher feels that learning is hard, drab, unsatisfying, with purposes for the distant future but not for today, how can the students' feelings be otherwise? Moods are easily communicated. When a teacher allows classroom activities to become a dull routine of day-after-day assignment and recitation, this is bound to take its toll both of student and teacher enthusiasm and zest. If the atmosphere for learning is to be positive, both teacher and students must feel real value in the experiences at hand.

Just as this book began with you—the student about to become a teacher—so it ends with you. You will be the critical factor in your students' learning. The best physical setting can do little for learning if the teacher is inadequate. The teacher is always the key.

Your feeling about teaching, your feeling about children, your feelings about all the things we have discussed in this book, and the sort of person you are will color the climate in which you teach. They will make the environment for learning a good one or a poor one.

From this book we hope you have laid a foundation for understanding learners and learning. You still will need to strengthen your convictions and broaden your understanding before you are ready to close the gate behind you and try to put what you have learned into practice.

A CONDENSED VERSION OF THE TAXONOMY OF EDUCATIONAL OBJECTIVES

This Taxonomy, as indicated in your text, is the result of a search for an orderly means of classifying—and thereby clarifying—educational objectives. Objectives in the cognitive domain, the first to be classified, have been organized according to the principle of complexity. The basic principle used in classifying objectives in the affective domain is that of internalization—the extent to which a given interest or value can be considered an essential part of a person's life style. The summary presented here describes the various categories of the Taxonomy and presents (in italics) samples of the kinds of objectives that fall within each one.

COGNITIVE DOMAIN

Knowledge

1.00 Knowledge Knowledge, as defined here, involves the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material. Although some alteration of the material may be required, this is a relatively minor part of the task. The knowledge objectives emphasize most the psychological processes of remembering. The process of relating is also involved in that a knowledge test situation requires the organization and reorganization of a problem such that it will furnish the appropriate signals and cues for the information and knowledge the individual possesses. To use an analogy, if one thinks of the mind as a file, the problem in a knowledge test situation is that of finding in the problem or task the appropriate signals, cues, and clues which will most effectively bring out whatever knowledge is filed or stored.

1.10 Knowledge of specifics. The recall of specific and isolable bits of information. The emphasis is on symbols with concrete referents. This material, which is at a very low level of abstraction, may be thought of as the elements from which more complex and abstract forms of knowledge are built.

1.11 Knowledge of terminology. Knowledge of the referents for specific symbols (verbal and nonverbal). This may include knowledge of the most generally accepted symbol referent, knowledge of the variety of symbols which may be used

for a single referent, or knowledge of the referent most appropriate to a given use of a symbol.

To define technical terms by giving their attributes, properties, or relations.

Familiarity with a large number of words in their common range of meanings.

1.12 Knowledge of specific facts. Knowledge of dates, events, persons, places, etc. This may include very precise and specific information such as the specific date or exact magnitude of a phenomenon. It may also include approximate or relative information such as an approximate time period or the general order of magnitude of a phenomenon.

The recall of major facts about particular cultures.

The possession of a minimum knowledge about the organisms studied in the laboratory.

1.20 Knowledge of ways and means of dealing with specifics. Knowledge of the ways of organizing, studying, judging, and criticizing. This includes the methods of inquiry, the chronological sequences, and the standards of judgment within a field as well as the patterns of organization through which the areas of the fields themselves are determined and internally organized. This knowledge is at an intermediate level of abstraction between specific knowledge on the one hand and knowledge of universals on the other. It does not so much demand the activity of the student in using the materials as it does a more passive awareness of their nature.

1.21 Knowledge of conventions. Knowledge of characteristic ways of treating and presenting ideas and phenomena. For purposes of communication and consistency, workers in a field employ usages, styles, practices, and forms which best suit their purposes and/or which appear to suit best the phenomena with which they deal. It should be recognized that although these forms and conventions are likely to be set up on arbitrary, accidental, or authoritative bases, they are retained because of the general agreement or concurrence of individuals concerned with the subject, phenomena, or problem.

Familiarity with the forms and conventions of the major types of works; e.g., verse, plays, scientific papers, etc.

To make pupils conscious of correct form and usage in speech and writing.

1.22 Knowledge of trends and sequences. Knowledge of the processes, directions, and movements of phenomena with respect to time.

Understanding of the continuity and development of American culture as exemplified in American life.

Knowledge of the basic trends underlying the development of public assistance programs.

1.23 Knowledge of classifications and categories. Knowledge of the classes, sets, divisions, and arrangements which are regarded as fundamental for a given subject field, purpose, argument, or problem.

To recognize the area encompassed by various kinds of problems or materials.

Becoming familiar with a range of types of literature.

1.24 Knowledge of criteria. Knowledge of the criteria by which facts, principles, opinions, and conduct are tested or judged.

Familiarity with criteria for judgment appropriate to the type of work and the purpose for which it is read.

Knowledge of criteria for the evaluation of recreational activities.

1.25 Knowledge of methodology. Knowledge of the methods of inquiry, techniques, and procedures employed in a particular subject field as well as those employed in investigating particular problems and phenomena. The emphasis here is on the individual's knowledge of the method rather than his ability to use the method.

Knowledge of scientific methods for evaluating health concepts.

The student shall know the methods of attack relevant to the kinds of problems of concern to the social sciences.

1.30 Knowledge of the universals and abstractions in a field. Knowledge of the major schemes and patterns by which phenomena and ideas are organized. These are the large structures, theories, and generalizations which dominate a subject field or which are quite generally used in studying phenomena or solving problems. These are at the highest levels of abstraction and complexity.

1.31 Knowledge of principles and generalizations. Knowledge of particular abstractions which summarize observations of phenomena. These are the abstractions which are of value in explaining, describing, predicting, or in determining the most appropriate and relevant action or direction to be taken.

Knowledge of the important principles by which our experience with biological phenomena is summarized.

The recall of major generalizations about particular cultures.

1.32 Knowledge of theories and structures. Knowledge of the body of principles and generalizations together with their interrelations which present a clear, rounded, and systematic view of a complex phenomenon, problem, or field. These are the most abstract formulations, and they can be used to show the interrelation and organization of a great range of specifics.

The recall of major theories about particular cultures.

Knowledge of a relatively complete formulation of the theory of evolution.

Intellectual abilities and skills

Abilities and skills refer to organized modes of operation and generalized techniques for dealing with materials and problems. The materials and problems may be of such a nature that little or no specialized and technical information is required. Such information as is required can be assumed to be part of the individual's general fund of knowledge. Other problems may require specialized and technical information at a rather high level such that specific knowledge and skill in dealing with the problem and the materials are required. The abilities and skills objectives emphasize the mental processes of organizing and reorganizing material to achieve a particular purpose. The materials may be given or remembered.

2.00 Comprehension This represents the lowest level of understanding. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications.

2.10 Translation. Comprehension as evidenced by the care and accuracy with which the communication is paraphrased or rendered from one language or form of communication to another. Translation is judged on the basis of faithfulness and accuracy; that is, on the extent to which the material in the original communication is preserved although the form of the communication has been altered.

The ability to understand nonliteral statements (metaphor, symbolism, irony, exaggeration).

Skill in translating mathematical verbal material into symbolic statements and vice versa.

2.20 Interpretation. The explanation or summarization of a communication. Whereas translation involves an objective part-for-part rendering of a communication, interpretation involves a reordering, rearrangement, or new view of the material.

The ability to grasp the thought of the work as a whole at any desired level of generality.

The ability to interpret various types of social data.

2.30 Extrapolation. The extension of trends or tendencies beyond the given data to determine implications, consequences, corollaries, effects, etc., which are in accordance with the conditions described in the original communication.

The ability to deal with the conclusions of a work in terms of the immediate inference made from the explicit statements.

Skill in predicting continuation of trends.

3.00 Application The use of abstractions in particular and concrete situations. The abstractions may be in the form of general ideas, rules of procedures, or generalized methods. The abstractions may also be technical principles, ideas, and theories which must be remembered and applied.

Application to the phenomena discussed in one paper of the scientific terms or concepts used in other papers.

The ability to predict the probable effect of a change in a factor on a biological situation previously at equilibrium.

4.00 Analysis The breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed are made explicit. Such analyses are intended to clarify the communication, to indicate how the communication is organized, and the way in which it manages to convey its effects, as well as its basis and arrangement.

4.10 Analysis of elements. Identification of the elements included in a communication.

The ability to recognize unstated assumptions.

Skill in distinguishing facts from hypotheses.

4.20 Analysis of relationships. The connections and interactions between elements and parts of a communication.

Ability to check the consistency of hypotheses with given information and assumptions.

Skill in comprehending the interrelationships among the ideas in a passage.

4.30 Analysis of organizational principles. The organization, systematic arrangement, and structure which hold the communication together. This includes the "explicit" as well as "implicit" structure. It includes the bases, necessary arrangement, and mechanics which make the communication a unit.

The ability to recognize form and pattern in literary or artistic works as a means of understanding their meaning.

Ability to recognize the general techniques used in persuasive materials, such as advertising, propaganda, etc.

5.00 Synthesis The putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements, etc., and arranging and combining them in such a way as to constitute a pattern or structure not clearly there before.

5.10 Production of a unique communication. The development of a communication in which the writer or speaker attempts to convey ideas, feelings, and/or experiences to others.

Skill in writing, using an excellent organization of ideas and statements.

Ability to tell a personal experience effectively.

5.20 Production of a plan, or proposed set of operations. The development of a plan of operations. The plan should satisfy requirements of the task which may be given to the student or which he may develop for himself.

Ability to propose ways of testing hypotheses.

Ability to plan a unit of instruction for a particular teaching situation.

5.30 Derivation of a set of abstract relations. The development of a set of abstract relations either to classify or explain particular data or phenomena, or the deduction of propositions and relations from a set of basic propositions or symbolic representations.

Ability to formulate appropriate hypotheses based upon an analysis of factors involved, and to modify such hypotheses in the light of new factors and considerations.

Ability to make mathematical discoveries and generalizations.

6.00 Evaluation Judgments about the value of material and methods for given purposes. Quantitative and qualitative judgments about the extent to which material and methods satisfy criteria. Use of a standard of appraisal. The criteria may be those determined by the student or those which are given to him.

6.10 Judgments in terms of internal evidence. Evaluation of the accuracy of a communication from such evidence as logical accuracy, consistency, and other internal criteria.

Judging by internal standards, the ability to assess general probability of accuracy in reporting facts from the care given to exactness of statement, documentation, proof, etc.

The ability to indicate logical fallacies in arguments.

6.20 Judgments in terms of external criteria. Evaluation of material with reference to selected or remembered criteria.

The comparison of major theories, generalizations, and facts about particular cultures.

Judging by external standards, the ability to compare a work with the highest known standards in its field—especially with other works of recognized excellence.

AFFECTIVE DOMAIN

1.0 Receiving (attending) At this level we are concerned that the learner be sensitized to the existence of certain phenomena and stimuli; that is, that he be willing to receive or to attend to them. This is clearly the first and crucial step if the learner is to be properly oriented to learn what the teacher intends that he will. To indicate that this is the bottom rung of the ladder, however, is not at all to

imply that the teacher is starting *de novo*. Because of previous experience (formal or informal), the student brings to each situation a point of view or set which may facilitate or hinder his recognition of the phenomena to which the teacher is trying to sensitize him. . . .

1.1 Awareness. *Awareness* is almost a cognitive behavior. But unlike *Knowledge*, the lowest level of the cognitive domain, we are not so much concerned with a memory of, or ability to recall, an item or fact as we are that, given appropriate opportunity, the learner will merely be conscious of something—that he take into account a situation, phenomenon, object, or stage of affairs. Like *Knowledge* it does not imply an assessment of the qualities or nature of the stimulus, but unlike *Knowledge* it does not necessarily imply attention. There can be simple awareness without specific discrimination or recognition of the objective characteristics of the object, even though these characteristics must be deemed to have an effect. The individual may not be able to verbalize the aspects of the stimulus which cause the awareness.

Develops awareness of aesthetic factors in dress, furnishings, architecture, city design, good art, and the like.

Develops some consciousness of color, form, arrangement, and design in the objects and structures around him and in descriptive or symbolic representations of people, things, and situations.

1.2 Willingness to receive. In this category we have come a step up the ladder but are still dealing with what appears to be cognitive behavior. At a minimum level, we are here describing the behavior of being willing to tolerate a given stimulus, not to avoid it. Like *Awareness*, it involves a neutrality or suspended judgment toward the stimulus. At this level of the continuum the teacher is not concerned that the student seek it out, nor even, perhaps, that in an environment crowded with many other stimuli the learner will necessarily attend to the stimulus. Rather, at worst, given the opportunity to attend in a field with relatively few competing stimuli, the learner is not actively seeking to avoid it. At best, he is willing to take notice of the phenomenon and give it his attention.

Attends (carefully) when others speak—in direct conversation, on the telephone, in audiences.

Appreciation (tolerance) of cultural patterns exhibited by individuals from other groups—religious, social, political, economic, national, etc.

Increase in sensitivity to human need and pressing social problems.

1.3 Controlled or selected attention. At a somewhat higher level we are concerned with a new phenomenon, the differentiation of a given stimulus into figure and ground at a conscious or perhaps semiconscious level—the differentiation of aspects of a stimulus which is perceived as clearly marked off from adjacent impressions. The perception is still without tension or assessment, and the student may not know the technical terms or symbols with which to describe it correctly or precisely to others. In some instances it may refer not so much to the selectivity of attention as to the control of attention, so that when certain stimuli are present they will be attended to. There is an element of the learner's controlling the atten-

tion here, so that the favored stimulus is selected and attended to despite competing and distracting stimuli.

Listens to music with some discrimination as to its mood and meaning and with some recognition of the contributions of various musical elements and instruments to the total effect.

Alertness toward human values and judgments on life as they are recorded in literature.

2.0 Responding At this level we are concerned with responses which go beyond merely attending to the phenomenon. The student is sufficiently motivated that he is not just 1.2 *Willing to attend*, but perhaps it is correct to say that he is actively attending. As a first stage in a "learning by doing" process the student is committing himself in some small measure to the phenomena involved. . . .

This is the category that many teachers will find best describes their "interest" objectives. Most commonly we use the term to indicate the desire that a child become sufficiently involved in or committed to a subject, phenomenon, or activity that he will seek it out and gain satisfaction from working with it or engaging in it.

2.1 Acquiescence in responding. We might use the word "obedience" or "compliance" to describe this behavior. As both of these terms indicate, there is a passiveness so far as the initiation of the behavior is concerned, and the stimulus calling for this behavior is not subtle. Compliance is perhaps a better term than obedience, since there is more of the element of reaction to a suggestion and less of the implication of resistance or yielding unwillingly. The student makes the response, but he has not fully accepted the necessity for doing so.

Willingness to comply with health regulations.

Obeys the playground regulations.

2.2 Willingness to respond. The key to this level is in the term "willingness," with its implication of capacity for voluntary activity. There is the implication that the learner is sufficiently committed to exhibiting the behavior that he does so not just because of a fear of punishment, but "on his own" or voluntarily. It may help to note that the element of resistance or of yielding unwillingly, which is possibly present at the previous level, is here replaced with consent or proceeding from one's own choice.

Acquaints himself with significant current issues in international, political, social, and economic affairs through voluntary reading and discussion.

Acceptance of responsibility for his own health and for the protection of the health of others.

2.3 Satisfaction in response. The additional element in the step beyond the *Willingness to respond* level, the consent, the assent to responding, or the voluntary response, is that the behavior is accompanied by a feeling of satisfaction, an emotional response, generally of pleasure, zest, or enjoyment. . . .

The category is arbitrarily placed at this point in the hierarchy where it seems to appear most frequently and where it is cited as or appears to be an important component of the objectives at this level on the continuum. The category's inclusion at this point serves the pragmatic purpose of reminding us of the presence of the emotional component and its value in the building of affective behaviors. But it should not be thought of as appearing and occurring at this one point in the continuum and thus destroying the hierarchy which we are attempting to build.

Enjoyment of self-expression in music and arts and crafts as another means of personal enrichment.

Finds pleasure in reading for recreation.

Takes pleasure in conversing with many different kinds of people.

3.0 Valuing This is the only category headed by a term which is in common use in the expression of objectives by teachers. Further, it is employed in its usual sense: that a thing, phenomenon, or behavior has worth. This abstract concept of worth is in part a result of the individual's own valuing or assessment, but it is much more a social product that has been slowly internalized or accepted and has come to be used by the student as his own criterion of worth.

Behavior categorized at this level is sufficiently consistent and stable to have taken on the characteristics of a belief or an attitude. The learner displays this behavior with sufficient consistency in appropriate situations that he comes to be perceived as holding a value. At this level, we are not concerned with the relationships among values but rather with the internalization of a set of specified, ideal, values. Viewed from another standpoint, the objectives classified here are the prime stuff from which the conscience of the individual is developed into active control of behavior.

This category will be found appropriate for many objectives that use the term "attitude" (as well as, of course, "value").

An important element of behavior characterized by *Valuing* is that it is motivated, not by the desire to comply or obey, but by the individual's commitment to the underlying value guiding the behavior.

3.1 Acceptance of a value. At this level we are concerned with the ascribing of worth to a phenomenon, behavior, object, etc. The term "belief," which is defined as "the emotional acceptance of a proposition or doctrine upon what one implicitly considers adequate ground" (English and English, 1958, p. 64), describes quite well what may be thought of as the dominant characteristic here. Beliefs have varying degrees of certitude. At this lowest level of *Valuing* we are concerned with the lowest levels of certainty; that is, there is more of a readiness to re-evaluate one's position than at the higher levels. It is a position that is somewhat tentative.

One of the distinguishing characteristics of this behavior is consistency of response to the class of objects, phenomena, etc. with which the belief or attitude is identified. It is consistent enough so that the person is perceived by others as holding the belief or value. At the level we are describing here, he is both sufficiently consistent that others can identify the value, and sufficiently committed that he is willing to be so identified.

Continuing desire to develop the ability to speak and write effectively.
Grows in his sense of kinship with human beings of all nations.

3.2 Preference for a value. This provision for this subdivision arose out of a feeling that there were objectives that expressed a level of internalization between the mere acceptance of a value and commitment in an area. Behavior at this level implies not just the acceptance of a value to the point of being willing to be identified with it, but the individual is sufficiently committed to the value to pursue it, to seek it out, to want it.

Assumes responsibility for drawing reticent members of a group into conversation.

Deliberately examines a variety of viewpoints on controversial issues with a view to forming opinions about them.

Actively participates in arranging for the showing of contemporary artistic efforts.

3.3 Commitment. Belief at this level involves a high degree of certainty. The ideas of "conviction" and "certainty beyond a shadow of a doubt" help to convey further the level of behavior intended. In some instances this may border on faith, in the sense of it being a firm emotional acceptance of a belief upon admittedly nonrational grounds. Loyalty to a position, group, or cause would also be classified here.

The person who displays behavior at this level is clearly perceived as holding the value. He acts to further the thing valued in some way, to extend the possibility of his developing it, to deepen his involvement with it and with the things representing it. He tries to convince others and seeks converts to his cause. There is a tension here which needs to be satisfied; action is the result of an aroused need or drive. There is a real motivation to act out the behavior.

Devotion to those ideas and ideals which are the foundations of democracy.

Faith in the power of reason and in methods of experiment and discussion.

4.0 Organization As the learner successively internalizes values, he encounters situations for which more than one value is relevant. Thus necessity arises for (a) the organization of the values into a system, (b) the determination of the interrelationships among them, and (c) the establishment of the dominant and pervasive ones. Such a system is built gradually, subject to change as new values are incorporated. This category is intended as the proper classification for objectives which describe the beginnings of the building of a value system. It is subdivided into two levels, since a prerequisite to interrelating is the conceptualization of the value in a form which permits organization. *Conceptualization* forms the first subdivision in the organization process, *Organization of a value system* the second. . . .

4.1 Conceptualization of a value. In the previous category, 3.0 *Valuing*, we noted that consistency and stability are integral characteristics of the particular

value or belief. At this level (4.1) the quality of abstraction or conceptualization is added. This permits the individual to see how the value relates to those that he already holds or to new ones that he is coming to hold.

Conceptualization will be abstract, and in this sense it will be symbolic. But the symbols need not be verbal symbols. Whether conceptualization first appears at this point on the affective continuum is a moot point. . . .

Attempts to identify the characteristics of an art object which he admires.

Forms judgments as to the responsibility of society for conserving human and material resources.

4.2 Organization of a value system. Objectives properly classified here are those which require the learner to bring together a complex of values, possibly disparate values, and to bring these into an ordered relationship with one another. Ideally, the ordered relationship will be one which is harmonious and internally consistent. This is, of course, the goal of such objectives, which seek to have the student formulate a philosophy of life. In actuality, the integration may be something less than entirely harmonious. More likely the relationship is better described as a kind of dynamic equilibrium which is, in part, dependent upon those portions of the environment which are salient at any point in time. In many instances the organization of values may result in their synthesis into a new value or value complex of a higher order.

Weighs alternative social policies and practices against the standards of the public welfare rather than the advantage of specialized and narrow interest groups.

Develops a plan for regulating his rest in accordance with the demands of his activities.

5.0 Characterization by a value or value complex At this level of internalization the values already have a place in the individual's value hierarchy, are organized into some kind of internally consistent system, have controlled the behavior of the individual for a sufficient time that he has adapted to behaving this way; and an evocation of the behavior no longer arouses emotion or affect except when the individual is threatened or challenged.

The individual acts consistently in accordance with the values he has internalized at this level, and our concern is to indicate two things: (a) the generalization of this control to so much of the individual's behavior that he is described and characterized as a person by these pervasive controlling tendencies, and (b) the integration of these beliefs, ideas, and attitudes into a total philosophy or world view. These two aspects constitute the subcategories.

5.1 Generalized set. The generalized set is that which gives an internal consistency to the system of attitudes and values at any particular moment. It is selective responding at a very high level. It is sometimes spoken of as a determining tendency, an orientation toward phenomena, or a predisposition to act in a certain way. The generalized set is a response to highly generalized phenomena. It is a persistent and consistent response to a family of related situations or objects. It

may often be an unconscious set which guides action without conscious forethought. The generalized set may be thought of as closely related to the idea of an attitude cluster, where the commonality is based on behavioral characteristics rather than the subject or object of the attitude. A generalized set is a basic orientation which enables the individual to reduce and order the complex world about him and to act consistently and effectively in it.

Readiness to revise judgments and to change behavior in the light of evidence.

Judges problems and issues in terms of situations, issues, purposes, and consequences involved rather than in terms of fixed, dogmatic precepts or emotionally wishful thinking.

5.2 Characterization. This, the peak of the internalization process, includes those objectives which are broadest with respect both to the phenomena covered and to the range of behavior which they comprise. Thus, here are found those objectives which concern one's view of the universe, one's philosophy of life, one's *Weltanschauung*—a value system having as its object the whole of what is known or knowable.

Objectives categorized here are more than generalized sets in the sense that they involve a greater inclusiveness and, within the group of attitudes, behaviors, beliefs, or ideas, an emphasis on internal consistency. Though this internal consistency may not always be exhibited behaviorally by the students toward whom the objective is directed, since we are categorizing teachers' objectives, this consistency feature will always be a component of *Characterization* objectives.

As the title of the category implies, these objectives are so encompassing that they tend to characterize the individual almost completely.

Develops for regulation of one's personal and civic life a code of behavior based on ethical principles consistent with democratic ideals.

Develops a consistent philosophy of life.

Reference Manual

ELEMENTS OF GENERAL PSYCHOLOGY

by James W. Hall

The Science of Psychology
Heredity and Behavior
Sensation and Perception
Conditioning
Verbal Behavior
Motivation
Personality
Social Psychology
Statistics

ELEMENTS OF
GENERAL PSYCHOLOGY

Section 1

 THE SCIENCE OF PSYCHOLOGY

Psychology is concerned with understanding the mind and the behavior of man. Thus, in one sense, psychology is a very old field indeed. Why then, we may ask, do we understand so much less about ourselves than about the physical universe? Perhaps it is because in another sense psychology is a very new field. Physics became an objective science several centuries ago; psychology did not do so until recently. Only within the past 50 or 60 years has there been general agreement that application of the scientific method to the study of human behavior is both possible and desirable. Even now, despite fairly impressive advances, there are many who argue against the validity of this approach where human behavior is concerned. We all acknowledge that some of our most important insights about human behavior have come from nonscientists, e.g., the writer, the philosopher. However, the psychologist, along with other behavioral scientists, is convinced that scientific inquiry into the behavior of man will pay off as no other approach can. Perhaps the most convincing support for this position is that in so many cases when scientists have persistently attacked problems, these problems have yielded to their efforts. In other words, there is every reason to expect a high pay-off in the future because there have been high pay-offs in the past.

Unfortunately, it is the nature of scientific inquiry that progress is slow. Breakthroughs come only after years of painstaking research and the exploration of many blind alleys. Psychology is no exception to this rule. The psychologist's long-range goal is to provide us with an understanding of behavior, especially complex human behavior. We wish to be able to predict accurately what a particular human being will do in a particular set of circumstances or conditions. At present, this goal is far in the future. A great deal of the psychologist's effort is directed toward learning more about simple forms of behavior in which most of us are not particularly interested. For example, how many of us really care about how fast rats run down alleyways under different conditions of food and water deprivation? Who cares that ROQ and MEV can be learned more quickly than RLB and MVT? The psychologist cares, but only because this kind of information can help him understand more complex and socially relevant behavior. The assumption here is that before we can explain and predict more complex behavior, we must be able to explain simpler forms of behavior. Once the basic processes that underlie these simpler forms of behavior are well understood, the psychologist can tackle the important problems more effectively. This has been the case in other sciences. Galileo did not study the speed with which balls rolled down inclined planes because of an overwhelming interest in those balls. These studies were vehicles by which he moved toward an understanding of basic physical laws. This is what the psychologist is doing when he conducts laboratory experiments under highly controlled conditions, observing simple kinds of responses made, in many cases, by white rats.

One unfortunate characteristic of this approach is that we are faced with many important problems with which psychology cannot yet be of as much help as we would like. We wish to know how to educate children to be better problem-solvers, and how to cure persons who are mentally ill. No matter how pressing the problem, though, it seems that there are no magical shortcuts in science. Psychology cannot provide the optimal solution to these and many other vital problems at present. Nor will it do so in the future except through the slow, painful process described above. No one, of course, would suggest that we wait until all the answers have been found before attempting to attack these problems. We must make our decisions about teaching and curriculum planning on the basis of the incomplete evidence that we have plus a large share of what is generally called intuition or common sense. Happily, it seems that within the past few years evidence from psychologists that is relevant to educators is being produced at a markedly higher rate. Many psychologists have turned from simple rat behavior toward the study of complex human behavior and seem to be making progress.

Some assumptions, definitions, and rules

For no behavior that you can think of is there a single "cause." Psychologists agree that behavior is multiply caused or, as many prefer to say, *multiply determined*. It may be helpful to think of the determinants of human behavior as falling into one of three classes: heredity (genetic factors), past experience (environmental factors), and the present situation (also environmental factors).

Psychologists are interested in discovering the laws that describe the ways these factors influence behavior. A scientific law is a statement of a relationship, identified through research, between some such factor and some type of behavior. When such a relationship is suspected but not yet established through research, it is often called a *hypothesis*. Consider Statement A: "Children who are praised for their work will work harder in the future."

For a hypothesis to be considered scientific, it must be empirically testable. That is, there must be some way to test the proposition through *observation*. The variables or concepts included in the statement must be definable *operationally*. An operational definition is one that leaves no doubt as to what is meant, because it describes precisely the operations by which the thing being studied can be observed. Let's examine Statement A. Can we operationally define the key concepts in that statement? In order to be able to test Statement A we must specify precisely what is meant by "praised for their work," "work harder in the future," and "children." This is not difficult. We can define "praised for their work" as writing "Very well done" on a particular set of papers the children turn in. We can define "work harder in the future" as teachers' judgments of amount of improvement in the quality of a written assignment turned in a week later by children who have received such praise as compared with children who have not received praise. Finally, we can define "children" as students in the fifth grade. Thus, the statement qualifies as a scientific hypothesis, since it can be put to a test by scientific procedures. Because the variables involved have been operationally defined, we can know exactly what is being tested, and the experiment can be repeated or replicated by others. Subjectivity and secrecy do not mix well with science.

Imagine that Statement A is tested several times by several different investigators using the operations described above, and each time the results agree with the hypothesis (as they probably would). Now it has moved toward the status of a law. However, it would be a weak law at that point for two reasons. First, it would not have a high degree of generality. That is, it would apply only to cases where praise is in written form, where the effects are on performance a week later, and where the children are about ten years old. To make the law more general, and thus more useful, we would want to experimentally examine the effects of vocal, as well as written, praise, study the effects over longer time intervals, use subjects of varying ages, etc.

A second weakness is the fact that the relationship between praise and subsequent effort is not stated very precisely. The law does not tell us how much praise is necessary to produce any effect on effort. It does not tell us whether a great deal of praise will produce more effort than a moderate amount of praise. Is there some point after which increases in amount of praise no longer affect subsequent effort? None of these questions are answered by Statement A, and a great deal more research would be required before the law would become that precise. Still, it is a good beginning and at least may offer a guide line to the teacher.

Now consider a second proposition, Statement B: "God helps those who help themselves." Although many of us believe this statement to be true, scientists agree that there is no way to specify the operations by which it could be tested empirically. Thus, the statement does not qualify as a scientific hypothesis. It is outside the province of science. Our acceptance or rejection of it must be based on other grounds.

Scientific laws serve a very practical purpose—to enable man to *predict*, and, in some cases, to *control*, events. Psychological laws already have influenced the decisions of innumerable teachers, industrial workers, military planners, psychotherapists, and others. Another function of scientific laws is less practical. We have always been curious about what makes us tick. Psychological laws are basic to this kind of understanding.

Methods of inquiry and control

Most of the vital questions in which psychologists are interested have to do with what we generally think of as cause-effect relationships. It is interesting, perhaps important, and not difficult to find out that reading problems are more common among boys than among girls. However, the more interesting, more important, and more difficult question is "Why?" In fact, this particular question has simply never been answered adequately.

The most powerful method for attacking questions about causal relations is the *experimental method*. We saw an example of this approach when we considered how we might test the hypothesis that "Children who are praised for their work will work harder in the future." What we are interested in here are the effects of praise on effort. Amount of praise is the *independent variable* and amount of subsequent effort is the *dependent variable*. In using the experimental method, the investigator produces changes in the independent variable (e.g. praise vs. no praise) and looks for corresponding change in the dependent variable. If the de-

pendent variable (amount of effort) changes, then we can attribute this change to the independent variable (amount of praise), *provided* that there is nothing else that might have produced the change. Thus, the experimental method requires a high degree of *control* of the experimental situation by the experimenter. He must arrange conditions so that any change in the dependent variable could have been produced *only* by the independent variable in which he is interested. Only then can he infer that a causal relationship has been demonstrated. A common approach to achieving the necessary degree of control involves the use of a fairly large number of subjects and the random assignment of subjects to conditions. Take the praise-effort example again. One approach would be simply to compare the quality of the children's work before and after being praised. But if the quality of work is higher following praise, is it necessarily due to the praise? Isn't it likely that children's work will improve as they get more practice anyway? This certainly is a possibility, so to do the research this way would be undesirable. The most obvious step to take would be to divide the children into two groups, give praise to only one of the groups, then compare the performance of the two groups in subsequent effort.

But isn't it possible that the two groups might differ in effort for other reasons? Maybe one group has several children in it who are simply very hard workers, regardless of praise. To avoid this possibility the most common procedure is to use a fairly large number of children and to assign them to the two groups *randomly*. By following such a procedure one can be fairly confident that individual differences among students are distributed approximately equally between the two groups.

It is clear that the experimental method offers the most powerful approach to the psychologist who is attempting to discover causal relationships. However, practical and ethical considerations frequently prevent its use, especially in research with human beings. Suppose one suspects that frequent physical handling of young infants is vital to healthy personality development. Is the psychologist going to assign one group of infants to be handled frequently and another group to receive little or no handling? Of course not! Even if this were possible to arrange, ethical considerations would prevent it. In such situations two alternatives have been popular. One is to carry out the experiment using lower animals rather than humans. Of course the investigator must be cautious about generalizing from rats or monkeys to humans, but at least it is a step in the right direction. In fact, research with animals has helped us a great deal in learning more about human behavior.

The second alternative is to abandon the experimental method. Instead of *producing* the differences in independent variables, the experimenter looks for differences of the sort he wants that already exist. That is, he finds a group of infants who are receiving very little handling (perhaps in one of the poorer orphanages) and compares their later personality development with that of infants who receive frequent handling. Imagine that he finds less healthy personality development for the former group, just as he has predicted. Now, his results are *consistent* with his hypothesis, but they have not demonstrated that a *causal* relationship exists. There may have been other ways, environmental or hereditary, in which the two groups of infants differed. Perhaps it was these other factors that accounted for subsequent personality differences. What the investigator has done is to establish

that a *correlation* exists between amount of handling and subsequent personality. Many variables that are correlated are *not causally related*. For example, there is a positive correlation between the purchase of snow shovels and the frequency of broken limbs. No one is likely to infer that buying a snow shovel causes one to break an arm or leg, nor would we suspect that people who break their arms or legs are more apt to buy snow shovels. We shall leave it to the reader to speculate as to why this correlation exists.

The research approach that we are discussing is often called the *correlational method*, and *correlational studies* is the term applied to research employing this method. Although this method is less powerful than is the experimental method, it can provide us with extremely valuable information. By a series of well-planned correlational studies, we often can at least narrow down the possible determinants of certain behaviors. Moreover, knowledge of a correlation between two events gives us some basis for using one event to *predict* the other. This in itself is often extremely useful, as has been shown by developments in the field of testing.

Observation and measurement

It should be clear by now that systematic *observation* is at the heart of scientific inquiry. In psychology, the data on which we base our conclusions are a result of observations of behavior.

To be scientifically useful, observations must be reliable. Assume that we wish to determine whether the respiration rate of students increases when an instructor announces that an examination will be given. How can we devise a way by which changes in respiration rate can be observed? Suppose we station an observer in the classroom and he reports that students begin to breathe faster when the announcement is made. The usefulness of such a report is questionable unless we have evidence regarding the reliability of such observations. We might obtain evidence by having six observers in the classroom rather than just one, and by examining the extent of agreement among observers. The chances are that relatively low agreement would be found, indicating that a different observational technique should be sought. However, what if the agreement among observers were high? Couldn't this be due to the observers' awareness of the nature of the experiment, i.e., due to bias on the part of all the observers? The history of psychology has shown that the biases of an observer can influence his observations. For example, some of the earliest data provided us regarding the intellectual development of infants and children were based on baby biographies. The observations were made by parents, and it soon became clear that such data, however interesting, were of limited scientific value.

Many such experiences in psychology have made it evident that *objectivity* is a characteristic of scientifically useful observations. Whenever an observation is influenced by the particular characteristics of the observer, it is *subjective*, and has little value in a scientific sense. Techniques have been developed by which such variables as respiration rate, reaction time, and even much more complex forms of behavior can be observed objectively. These will not be described in detail here. However, some will be encountered as research in various areas of psychological investigation is described in subsequent sections.

Objectivity is not the only important characteristic of scientific observation. Recall that the psychologist seeks *precision* in his laws. For most variables studied there are degrees or amounts of whatever is being observed. Suppose that a psychologist is interested in whether the amount of illumination in a college classroom affects the degree to which students are attentive to lectures. To answer this question, the psychologist must manipulate (produce variations in) room brightness. This is easy to do by increasing or decreasing the wattage or the number of light bulbs in use. However, he must find some way of measuring the amount of illumination resulting from the various light conditions used. This is not difficult, since, as any amateur photographer knows, there are special instruments by which amount of illumination can be measured very precisely.

Next, our psychologist must find a way to measure the attentiveness of the students. This is more challenging. One approach would be to count the number of students who doze off during lectures. However, one can be inattentive to a lecture and still remain awake. There are degrees of inattention just as there are degrees of originality or hostility or anxiety or illumination. It turns out to be very difficult to measure attentiveness directly—except with a fairly low degree of precision. This example illustrates the fact that, at present, techniques for measuring physical conditions generally are far superior to those for measuring psychological conditions. In fact, measurement is such a difficult problem in psychology that a great many psychologists devote their professional lifetimes to the development of more effective ways to measure various aspects of behavior. Considerable progress has been made in the measurement of intellectual functioning and school achievement. There has been less success in efforts to measure many other so-called personality variables.

Section 2

HEREDITY AND BEHAVIOR

Consider the following statement by a prominent psychologist.

Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant chief, and, yes, even beggarman and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. There is no such thing as an inheritance of capacity, talent, temperament, mental constitution, and characteristics.
(Watson, 1919)

The statement was made early in this century by John B. Watson, one of the founding fathers of modern psychology. Watson's views were extremely influential, and for most of this century behavioral sciences have been concerned mainly with the study of environmental factors. However, within the past fifteen years the field of *behavior genetics* has developed rapidly, and there is now evidence of a hereditary component for a broad range of behavior. (An excellent overview of this field is provided by McClearn, 1964.)

Genetic transmission

The carriers of heredity are located on the *chromosomes*, tiny particles found in the nuclei of our cells. Each normal human body cell contains a total of 46 chromosomes, arranged in 23 pairs.

All the cells that go to make up our bodies come from the single cell formed at conception. This occurs through a process of cell division called *mitosis*. In this process each chromosome duplicates itself, so that one pair of chromosomes becomes *two* pair. The cell body and nucleus divide, and one pair of chromosomes goes to each of the new cells. This process is repeated again during the course of development in our bodies.

However, when germ cells (*gametes*) are formed, a different cell division process occurs. This process is called *meiosis* or *reduction division*. Here, although the cell body and nucleus divide, the chromosomes do not. Thus, instead of each new cell having both members of a pair of chromosomes, it has only *one member* of each pair, or a total of 23 rather than 46. At the time of conception the 23-chromosome sperm cell of the father unites with the 23-chromosome egg cell, or *ovum*, of the mother, producing a fertilized cell or *zygote* with a full complement of 46 chromosomes again.

The actual determiners of inherited characteristics are minute areas within the chromosomes known as *genes*. Each chromosome carries a vast number of genes, each specific to a particular genetic factor. That is, genes that determine, say, the color of a rat's coat occupy a specific position on a specific chromosome. Any given gene exists in two or more forms. To illustrate, let's assume that human eye color is determined solely by one type of gene which can exist in either of two forms. One form is associated with brown eyes, the other with blue eyes. Let's further assume that these particular genes are located on the *n*th pair of chromosomes. This means that in that pair there are two genes for eye color, one on each chromosome. In gene pairs such as this there frequently exists a dominant-recessive relationship, such that one type of gene, brown in this case, is dominant over the other. This means that when an individual has both brown (B) and blue (b), the brown will dominate and the color of the eyes will be brown. Thus an individual with Bb will have the same eye color as one with BB. We say that these two individuals are of the same *phenotype* (they both have brown eyes) but different *genotypes* (they have different combinations of genes). An important point is illustrated here: *We cannot infer genetic similarity simply on the basis of the similarity of directly observable features.*

The genetic difference can be seen easily if we assume that BB and Bb each marry someone who is bb. Imagine that Adams and Baker both are brown-eyed

men but that Adams carries a gene for blue (Bb) while Baker does not (BB). Now suppose each of these brown-eyed men marries a blue-eyed girl (bb), and each couple has a child. We can make certain predictions regarding the eye color of these offspring.

Mr. Adams

	B	b
b	Bb	bb
b	Bb	bb

Mr. Baker

	B	B
b	Bb	Bb
b	Bb	Bb

For the Adams family, the odds are 50-50 regarding eye color, since two of the four possible gene combinations yield blue eyes and two yield brown eyes. Further, we can be certain that if the child is brown-eyed, he will carry a recessive gene for blue eyes. The predictions for the Bakers are also clear. The probability of a blue-eyed child is zero—all their children will have brown eyes, and all will carry a recessive gene for blue.

Even when both parents are brown-eyed an offspring may be blue-eyed if each parent carries a recessive gene. Thus if a brown-eyed Adams boy (Bb) marries a brown-eyed Baker girl (Bb) we have the situation shown below.

	B	b
B	BB	Bb
b	Bb	bb

The probability that a child of such a marriage will show the recessive trait is .25. This fact has important implications. Take, for example, a condition of mental deficiency called *phenylketonuria* or PKU. This defect, carried by a recessive gene, involves reduced ability to convert a particular amino acid into a form necessary for normal development. As long as one of the two genes involved is normal, no problem exists. However, if two persons each carrying the recessive gene for PKU are married, it is possible (probability = .25) that an offspring will be mentally deficient.

It is now possible to identify individuals who are carrying the PKU gene as a recessive. A normal relative of a phenylketonuric thus can determine whether he is a carrier. Knowledge of a husband and wife that each is a carrier could play an important part in their decisions regarding having children.

Some conditions of mental deficiency are inherited as dominants. An example is *Huntington's chorea*, which results in progressive neural degeneration accompanied by involuntary movements and usually by mental impairment. The age of onset may vary from 10 to 70 years of age, but is typically between 30 and 50. This late onset makes genetic counseling difficult since many such persons already have had children. Since the condition is dominant, one half the children, on the average, will receive the gene resulting in the abnormality.

This last example illustrates a fundamental point. In general, presence at birth is *not* a criterion of inheritance. That is, characteristics that are *not* present at birth may nevertheless be genetically determined. We must regard the genetic role in development as persisting from conception to death. Moreover, characteristics that *are* present at birth may *not* be genetically determined.

One of the more common forms of mental deficiency is called *Mongolism* because of certain superficial oriental facial characteristics. Mongolism is due to a particular type of genetic error wherein the individual possesses 47 rather than 46 chromosomes. The particular extra chromosome (#21) present in Mongoloids has been identified, but since that chromosome carries a large number of different genes, the particular causal factors have not yet been isolated.

Abnormalities in number of chromosomes have also been found in certain cases of abnormal sexual development. One particular pair of chromosomes determines inherited sex characteristics. The normal female possesses sex chromosomes symbolized XX. The normal male possesses XY. The Y chromosome is smaller in size and has fewer locations for genes. Since germ cells contain only one member of the pair, all ova contain an X chromosome, but when sperm cells are formed half of them will contain an X and half a Y. Thus we can see that theoretically the odds are 50-50 that the child of any particular union will be a boy.

	X	Y
X	XX	XY
X	XX	XY

In fact, however, the odds are somewhat greater for the birth of a boy (106 boys to 100 girls), for reasons that are not completely clear at present.

One type of abnormal sexual development in males is the *Klinefelter syndrome*, which involves development of the breasts and the absence of sperm production. In such cases the individual has often been found to possess an extra chromosome, so that instead of XY he has XXY. Abnormal sexual development in females has often been associated with the presence of only a single X chromosome.

The X and Y chromosomes are involved also in the explanation of sex differences in certain inherited characteristics because genes other than the sex-determining ones are also carried on this chromosome. Such genes occurring in the X chromosome account for *sex-linked* characteristics. Among the best known of these characteristics are red-green color blindness and hemophilia. Both of these depend upon *recessive* genes located on the X chromosome. The Y chromosome does not possess a gene relating to color vision or to blood coagulation. Thus if a female possesses the color-blindness gene on one X chromosome, the odds are that a normal gene which dominates it is present on her other X chromosome, preventing color blindness. In other words, two recessive genes are required if a female is to be color blind. With a male, however, only one such gene is required since there is no second gene. Obviously the odds against two such genes occurring together are much greater than against the occurrence of only one such gene, so that color blindness and hemophilia are much more frequently found among

males than among females. Certain other factors, such as hereditary baldness, are *sex-influenced*, in that they act as dominants in one sex and recessives in the other.

So far we have talked as though each inherited characteristic is a result of a single gene or gene pair. However, in many, if not most, cases this is not true. Take height for example. Individuals are not either tall or short. They vary continuously over a wide range. Yet height is strongly influenced by genetic factors. The resolution of this problem was provided by the *multiple factors hypothesis*, which postulates that a continuously varying trait is influenced by *many different genes*, each of which makes but a small contribution to the phenotypic end product.

Heredity, environment, and behavior

Any behavior is the cumulative outcome of complex interactions between genetic and environmental factors. These interactions begin at conception and continue throughout the individual's lifetime. Much research by geneticists and psychologists has been directed toward studying these interactions as they relate to various behavior traits. It is known that individual differences in certain traits are largely the result of individual differences in genetic make-up. For certain other traits, most of the differences among individuals are due chiefly to differences in past experience. We shall consider briefly some of the more important results of studies both with animals and with humans.

Studies of animals One of the most popular approaches to the study of heredity and behavior has been to inbreed animals, or to work with highly inbred strains. If strict inbreeding for a number of generations results in differences between strains of animals exposed to the same environment, then it is inferred that genetic factors account for these differences. (Animals are used for these studies for obvious reasons.) Such strain differences have been obtained for such behavioral characteristics as aggressiveness and learning ability.

In one of the most interesting examples of animal research, Freedman (1958) studied the effects of indulgent vs. disciplinary rearing approaches on certain behaviors of four breeds of dogs: Shetland sheepdogs, beagles, wire-haired fox terriers, and basenjis. The indulged pups were never punished and were encouraged to play and explore. The disciplined pups were restrained and taught to sit, stay, and come on command. These conditions were employed daily from the third to the eighth week, at which time all dogs were given a test. Food was placed in a bowl and for three minutes the dog was prevented from eating by a shout of "No" and a slap on the rear whenever he approached the food. Then the experimenter left the room and recorded the time that passed until the dog began eating. This test situation is directly analagous to some approaches that have been taken in studying resistance to temptation in human children.

The tests showed that type of rearing had a different effect for different breeds of dogs. The beagles and terriers who had received indulgent treatment delayed eating longer than those who had been disciplined. The basenjis and sheepdogs were not affected by type of rearing. The essential point to be noted here is that heredity and environment *interact*. That is, *the same environmental conditions may have quite different effects on individuals who differ genetically*.

Studies of twins Much of the human research regarding genetic influences has consisted of studies of twins. Such studies are based on the fact that *identical twins* have developed from the same fertilized egg cell, and thus are genotypically identical. Therefore, any differences between such twins must be the result of environmental factors. *Fraternal twins* have developed from different egg cells, so are not identical genetically. In fact, they are no more similar genetically than are siblings born at different times.

In one type of twin study, the extent to which identical twins are more similar than fraternal twins with regard to a certain trait is taken as an index of the degree to which that trait is determined by genetic factors. This reasoning assumes that environment is equally similar for the two types of twins, so that any greater similarity of identicals in, say, intelligence must be due to genetic factors. Unfortunately, the assumption of equal environmental similarity is not safe to make. Identical twins are more likely to be treated similarly by parents and others than are fraternal twins. Thus, findings based on studies of this sort are questionable.

Other twin studies have compared identical twins reared apart with both identical and fraternal twins reared together. Taken together, these and certain other approaches have provided us with convincing evidence that genetic factors play a major role in determining many behaviors that we generally classify under the heading *intelligence*. That is, a large portion of variation in intelligence among human beings is due to genetic factors. A somewhat smaller, but still substantial, influence of genetic factors on certain personality characteristics has been found also. For example, evidence suggests that genetic factors play a significant role, *along with* environmental conditions, in the development of schizophrenia (a form of severe mental illness).

Genetic factors also appear to play an important part in rate of sexual maturation, longevity, certain kinds of motor ability, and perhaps general activity level. Some research has suggested a genetically determined difference between males and females in activity level that is present even during early infancy and possibly prenatally.

Up to now we have mainly considered rather direct effects of heredity. With respect to personality, however, some of the most important effects probably are due to more subtle interactions of heredity and environment. The boy who, due to genetic factors, is tall, strong, and good-looking is likely to be more popular in school (and even at home) than is the short, frail boy, resulting in differences in social behavior.

Studies of racial differences This is raised here as a special topic because of the controversy that has existed in this area. Obviously, genetically determined racial differences exist. They exist in physical attributes such as skin color and facial features. But do they exist in other areas, particularly in intelligence? The most accurate general statement that can be made based on available evidence regarding racial differences is that no genetically determined differences in intellectual abilities or personality traits have been demonstrated. However, we have no proof that such differences do *not* exist. Results of studies have been ambiguous. For example, in nearly every study comparing Negroes and whites the mean IQ of Negroes has been lower. However, in no case can we be certain that environmental factors were equal or that the sample of Negroes tested was representative of all

Negroes. A similar conclusion must be reached with respect to questions regarding differences between orientals and occidentals, Jews and non-Jews, etc.

Although interesting theoretically, questions of genetic differences between racial and ethnic groups probably are of limited practical importance considering that the differences among individuals *within* such a group are so much greater than any average difference *between* groups.

Conclusions and implications

Even from such a sketchy overview as this, there are certain generalizations that should be clearly understood.

The fact that a particular characteristic or trait is present at birth does not indicate that it is genetically determined. Environmental influences begin at conception, so have been operating for about nine months, in most cases, before the infant appears. The most obvious examples of prenatal influences are those cases in which severe abnormalities of development are produced by drugs (e.g., thalidomide) or disease (e.g., German measles) within the first few weeks after conception. Other prenatal influences (e.g., severe emotional upset on the part of the mother) are more subtle in their operation and effects.

Related to the first generalization is the fact that *genetic factors operate and affect our physical and behavioral characteristics throughout our lifetime.* As in the case of Huntington's chorea or hereditary baldness, genetic factors may not produce their effects until relatively late in life.

A third point pertains to *individuality.* The total number of possible human genotypes is far greater than the total number of persons who have ever been born in the history of humanity. Except for identical multiple births, the odds against any two individuals being genetically identical are overwhelming.

A final point concerns the concept of interaction. No trait is either inherited or not inherited. *All traits that underlie human behavior are determined by the interaction of genetic and environmental factors.* The relative role of each and the precise nature of the interaction vary from trait to trait, but some interaction is *always* the case. If genotypically identical twins are reared under grossly differing conditions, they will differ markedly in many aspects of their behavior. Similarly, if genotypically different individuals are reared under similar conditions, they will differ in many aspects of their behavior.

The important implication of these facts is well stated by McClearn (1964):

Children of some genotypes may thrive under authoritarian upbringing; others may be stifled under any regime but a permissive one; the word method of teaching reading may be optimal for pupils of some genotypes, and the phonic system may be superior for others. In short, what is sauce for a goose may not only not be sauce for a gander, it may be poison to a different goose.

SENSATION AND PERCEPTION

The only way we have of obtaining information about the outside world is through our sensory systems. For example, certain wave lengths of electromagnetic radiation can be detected by our visual system. We call these *light waves*. Other wave lengths cannot be seen, nor can they be detected by any other sensory systems with which we are equipped. Examples of these are X rays and cosmic rays. What are the various characteristics of our environment that we can detect and what characteristics of ours make such detection possible? These broad questions introduce us to the field of sensory psychology—the study of sensation.

Since the sensory psychologist is interested in the precise properties of physical stimuli that we can detect, he draws heavily on the field of physics. In fact, many psychologists working in this area are known as *psychophysicists*. Their area of work is called *psychophysics* and their methods are termed *psychophysical methods*.

The study of sensory processes also is the concern of physiologists and other biological and physical scientists. Our purpose here is not to describe the various areas of specialization, but merely to point out how closely allied sensory psychology is with other scientific disciplines, particularly physics and sensory physiology. Sensory psychology is among the oldest and best developed areas within psychology. In this manual we will only skim the surface of our knowledge of sensation. Moreover, we will not attempt to describe the highly developed methods of research and techniques of measurement that characterize the area.

It is a common notion that we have five senses: vision, hearing, touch, taste, and smell. However, there are several additional senses. We are sensitive to warmth, cold, position and motion of our muscles and joints (*kinesthesia*), and to passive movement or disequilibrium. Although we shall touch on all of these, our major emphasis will be on vision and hearing. Before examining the various sensory systems individually, we shall consider some important characteristics shared by all.

All sensory systems consist of three major components: *receptors*, *afferent pathways*, and *sensory areas* in the brain. Receptors are nerve cells (*neurons*) that are sensitive to certain kinds of external stimulation. When a receptor is activated or excited, it starts a “message” toward the brain. The message consists of nerve impulses (electrical and chemical changes that move across a neuron) that travel through a bundle of neurons to the brain. These neural connections with the brain are the afferent pathways. The specific areas of the brain that receive the impulses are different for each sense, but all are located somewhere in the cortex, or outer portion, of the brain. It is the stimulation of these areas that results in the sensations that we experience.

However, the incoming stimulation is not the only determinant of what we experience. What we experience when we see an object is determined partly by

previous experiences. Different individuals viewing the same scene have different visual experiences, even though the incoming sensory messages are identical. This is our introduction to what psychologists mean by *perception*. Perception involves more than the sensory processes described. It also involves activity of the *association areas* of the brain that surround and are connected with the sensory areas. We shall consider this topic in greater detail later in the section.

Vision

Receptors for vision are of two types—*rods* and *cones*—and are located at the back of the retina of the eye. Although they function somewhat differently, both rods and cones are sensitive to light, and both are necessary for normal vision. It is estimated that there are about 6-1/2 million cones and 110 to 125 million rods in the retina. The cones are mainly responsible for our ability to see sharp detail during daylight and entirely responsible for color vision. The greatest concentration of cones is in the *fovea*, a small depression in the center of the retina. During daylight this is the point of clearest vision—the point on the retina where the image of what one is looking directly toward is focused. However, because more intense light is required to activate the cones, it is the more sensitive rods that serve us in dim light. Rods are not present in the fovea. Thus, one can see an object more clearly in dim light if he looks a little to the side of it.

There are three physical properties of light that strongly affect our visual experiences: *wave length*, *intensity*, and *complexity*. As the electrical charges we call *light* move through space, they emit radiant energy in regular waves. Wave length is the distance from one peak of energy release to the next. It is the major determinant of *hue* or color. That is, whether something is experienced as red or blue or green is primarily determined by wave length.

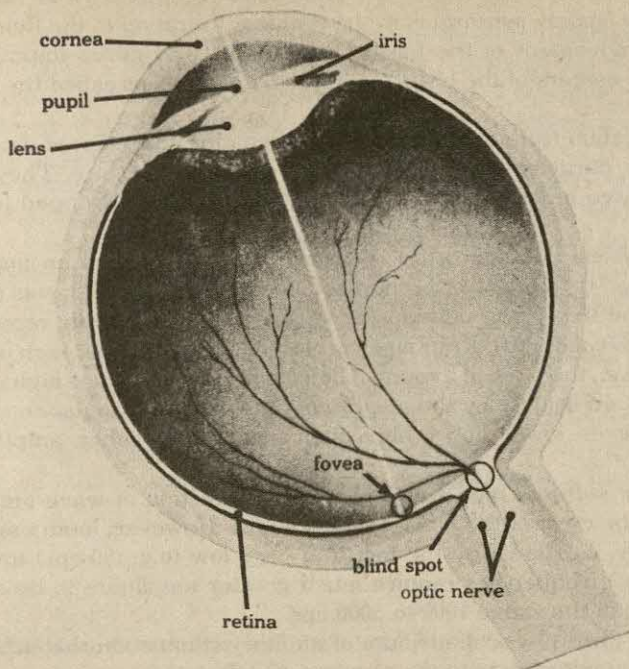
Intensity refers to the *amount* of radiant energy being transmitted. It is the primary determinant of how bright an object appears. It also has some effect on the hue of an object. Complexity refers to the number of different wave lengths in a given stimulus. The less complex the light waves coming from an object, the more saturated its color appears.

When light enters the eye, it is focused by the *cornea* and *lens* to form an image on the retina. The amount of light passing through the lens is controlled somewhat by the *iris*. In bright light the iris reduces the opening through which light can pass; in dim light the iris dilates to let more light through. Activation of rods and cones results in a neural message being transmitted through the *optic nerve* (the afferent pathway) to the visual projection area at the back of the brain, and at that point, we "see."

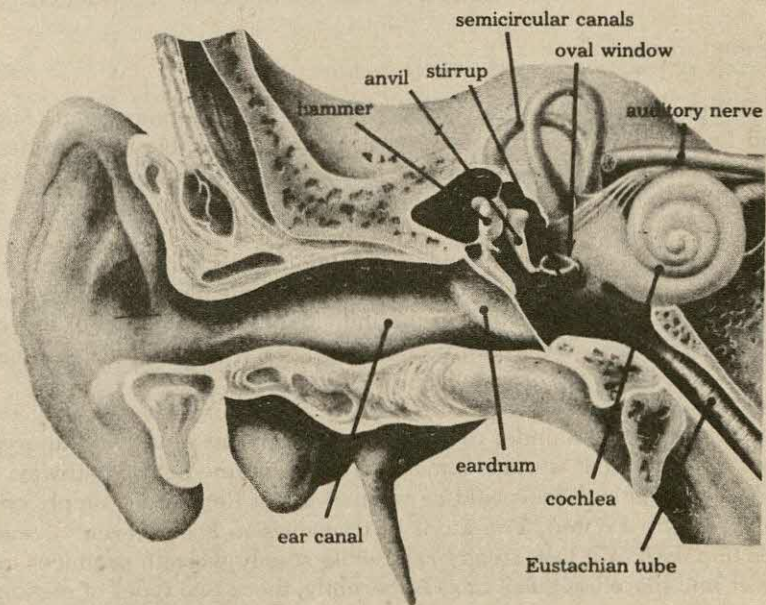
Audition

Receptors sensitive to sound are located in the *cochlea*, one of the two parts of the *inner ear*. The cochlea is a coiled-up tube filled with fluid. Sound waves enter the funnel-like outer ear and cause the *eardrum* to vibrate. From the eardrum the vibrations are transmitted by three small bones or *ossicles* (called, because of the

CROSS SECTION OF THE LEFT EYE SEEN FROM ABOVE



STRUCTURES OF THE HUMAN EAR



way they are shaped, the *hammer*, the *anvil*, and the *stirrup*) through the middle ear to the fluid of the cochlea in the inner ear. The sound receptors are located on a thin membrane (the *basilar membrane*) in the cochlea. Vibration of the fluid of the cochlea produces movement of the basilar membrane, and nerve impulses are sent to the auditory centers of the brain via a bundle of neurons called the *auditory nerve*.

Auditory stimulation (sound) consists of an alternating collection of dense and thinly dispersed air particles called *sound waves* or *sound pressure*. They travel from a stimulus source much as waves resulting from a pebble dropped in a still pool of water.

One of the physical characteristics of sound waves that plays an important part in what we hear is *frequency*, the number of complete sound waves (cycles) passing a given point in a given period of time. Frequency is usually reported in terms of *cycles per second* (cps). Frequency is closely related to how high or low a sound seems to be, i.e., the *pitch* of a sound. High frequencies produce high pitches. Pitch also is influenced slightly by the *amplitude* (intensity) of stimulation in that a low pitch is made even lower and a high pitch even higher when amplitude is increased.

The loudness or softness of a sound is mainly a function of wave amplitude (the distance from the crest of the wave to the trough). However, loudness also is related to frequency, as shown by the fact that very low (e.g., 50 cps) and very high (e.g., 20,000 cps) frequencies require much greater amplitude to be audible than do frequencies in the range 1000 to 5000 cps.

Complexity is a third physical attribute of auditory stimulation that influences what is heard. Complexity refers to the number of different frequencies involved in a sound. If only one frequency is involved, we have a "pure" tone. However, most sounds involve more than a single frequency. This is what determines the *timbre* or "quality" of sound.

Other senses

The second part of the inner ear consists of three *semicircular canals* filled with fluid and known as the *vestibular system*. Movement of this fluid excites nerve endings, and provides a sense of passive movement such as might occur when riding on a ship or in an airplane. These are the receptors primarily involved in causing seasickness or airsickness.

Nerve endings located in the muscles, tendons, and joints are responsible for *kinesthetic* sensitivity—the sense of active bodily movement. Kinesthesia, or *proprioception*, is critically important in the individual's coordination of movements. Without such sensitivity he would be unable to walk, to manipulate objects with his hands, to feed himself, or to talk.

The skin also is a sense organ. In it are receptors for *touch*, *warmth*, *cold*, and *pain*, sometimes grouped under the heading of *cutaneous* sensitivity. Interestingly, sensations of cold and of warmth sometimes use the same neural pathway. Thus it seems that whether one feels cold or warmth is not dependent simply on which nerve endings are excited. The kinds of transmission are different—steady cold produces impulses at a fast, steady rate while steady warmth produces impulses at a slower and more irregular rate. Apparently, these two types of messages are

then "sorted out" in the brain. This use of the same lines into the brain by different types of messages may be a fairly common event.

The cutaneous senses readily *adapt* to constant stimulation. When one first begins to wear a ring on his finger, he may feel its presence almost constantly. After a time, however, this awareness ceases almost completely. Or, recall the initial coldness of the water when one first dives into a pool, and how rapidly one adapts to its temperature.

The *gustatory* receptors (taste buds) are found largely on the surface of the tongue, although a few are present in the lining of the mouth and throat. The stimuli that excite these receptors are chemical substances in liquid form, and such stimulation leads to four taste sensations: sweet, bitter, sour, and salt. Taste buds readily adapt to stimulation. In fact, adaptation to one taste can result in heightened sensitivity to another, a *contrast effect*. Or, one taste may reduce sensitivity to another, e.g., after highly seasoned food, bland food seems tasteless.

The smell or *olfactory* receptors are located in the upper passages of the nasal cavity. They are activated by certain chemical substances in vaporous form. The olfactory receptors are important in experiences of taste as well as smell. Thus when nasal passages are congested, food seems less flavorful.

Sensory defects

In general, there are three points at which a breakdown in normal sensory processes can occur: the sense organs (including receptors), the afferent pathways, and the sensory areas of the cortex. Among the most common causes of such breakdowns are infectious diseases (particularly during early prenatal development), physical injuries, and genetic factors. Here we shall consider only certain deficiencies in the visual and auditory systems.

Visual deficiencies The most common visual defects are due to sense organ deficiencies, most of which involve the optical mechanisms. Three of the most common are *myopia* (near-sightedness), *hyperopia* (far-sightedness), and *astigmatism*. In all these conditions there are focusing errors (refractive errors) due to physical peculiarities of the eye. The myopic individual can see objects clearly when they are very close to him, but faraway objects are blurred (out of focus). With hyperopia, near objects are out of focus. Astigmatism is a condition of incorrect focus due to irregular curvature of the cornea or lens, and is responsible for more than half the cases of seriously impaired vision and for much eyestrain. In most cases, these three conditions may be compensated for by corrective lenses and so do not constitute serious problems. There are a number of other visual problems involving the optical mechanisms, but they are less common and will not be described here.

Defects in the optical mechanisms probably are largely genetically determined in most cases, although prenatal factors may be involved more frequently than we think. Visual experiences may sometimes play a major role, as in continual use of the eyes for fine work with poor lighting. Myopia and hyperopia are related to age. Young children tend to be somewhat myopic, whereas hyperopia increases markedly past forty.

The most common serious defects of the eye itself are those cases of severe injury to the optical mechanism. Fortunately, this is relatively uncommon because of the excellent protection provided by the bony structures surrounding the eye and because of our reflexes when the eye is threatened.

Many cases of blindness or near-blindness are due to neurological impairment. Generally these conditions are present at birth. In some cases genetic factors are involved, but more often the causes are traceable to events occurring early in pregnancy that result in errors in the development of neural pathways or the visual areas of the brain. Such events include certain infectious diseases (e.g., German measles), excessive radiation (e.g., from X rays), incompatibility of blood chemistry between mother and fetus (the Rh negative problem), and malnutrition. (These events can result in a variety of abnormal conditions, including mental deficiency and gross physical malformations.)

In the early 1950's there was a sharp increase in blindness in cases of prematurely born infants. Eventually this was traced to an error in medical procedures. Often premature infants are given oxygen, and in some cases excessive oxygen was being administered. This resulted in retarded development of the retina, a condition called *retrolental fibroplasia*. Once the cause was discovered, procedures for administering oxygen were modified, and this condition has all but disappeared.

Another major cause of blindness is severe head injuries that affect the sensory areas of the brain or the afferent pathways. In cases where there is neurological impairment, it generally is not possible to reverse or correct the condition.

The final type of visual deficiency that we shall consider is *color blindness*. Total color blindness is extremely rare, occurring in one of 40,000 persons. What is generally meant by color blindness is that certain hues that appear different to the normal person look the same to the color-blind person. Most common are cases in which red and green are indistinguishable. These conditions are much more common in men (about 50 in a thousand) than in women (about one in a thousand). The genetic basis of color blindness and of the sex difference in frequency was described in Section 2.

Auditory defects The two general kinds of auditory weakness are *intensity deafness* and *tone deafness*. Intensity deafness is the more crippling abnormality and may occur in any of three forms: *conduction*, *nerve*, or *central* deafness. Conduction deafness results from abnormalities in the middle ear, generally due either to a damaged eardrum or to malfunction of the three ossicles. With conduction deafness the hearing loss usually is about equally great for all frequencies. Thus a mild hearing loss of this type can be compensated for by a hearing aid that simply amplifies all sound frequencies. There also are surgical techniques that are relatively successful in cases of conduction deafness involving the ossicles.

Nerve deafness is the result of damage to, or deterioration of, receptors in the basilar membrane or the afferent pathways. With nerve deafness the loss usually is considerably greater for some frequencies than for others. Thus, general amplification of sound, though often helpful, is far from an ideal measure. As an individual ages, there is a general decrease in sensitivity to high frequency tones resulting from progressive nerve deterioration.

The basis for central deafness is damage to the auditory areas of the brain.

Thus, central deafness can occur even though all the mechanisms of the ear are perfectly normal. Neither nerve deafness nor central deafness is reversible.

The etiology of intensity deafness is similar to that of blindness. In a high proportion of cases of deafness, the deficiency is present at birth. As with blindness, genetic factors probably are involved in a minority of cases, with prenatal events being the most common causal factors. In cases where deafness occurs prior to the child's acquisition of language and speech, the resulting communication problems are extremely severe.

Tone deafness is analogous to color blindness. Here the individual cannot distinguish between tones of differing frequency. Although this reduces one's opportunities to pursue a career in music, the consequences of tone deafness are not nearly so great as those of intensity deafness.

Perception

Perception, as we have said, is more than just a complex sensation. As we walk past a building, the pattern of stimulation on the retina changes. Yet the building is seen as remaining stationary. As we approach a friend, the image of him projected on our retina becomes larger. Yet our friend does not appear to grow in size as he comes near. A dinner plate seen as circular from above is seen as the same dinner plate when we back away from it, even though its image on our retina now is elliptical.

The retina is a two-dimensional surface. Why, then, are we not restricted to a two-dimensional world? The inescapable conclusion seems to be that between the projection of a visual pattern in the visual cortex and our conscious experience of objects in view, complex processes occur that convert the visual pattern into our perception—whether in the projection areas themselves or in the association areas or both we do not yet know. In any case, these processes introduce a greater degree of stability and order into the world we perceive than actually exists in terms of the raw sensory stimulation.

In the remainder of this section we shall deal briefly with some of the better known problems and phenomena of perception. Only visual and auditory perception will be considered, and greatest emphasis will be placed on the former.

Perception of visual space The problem of visual depth perception that we have just been discussing has been a major challenge in perception. Why do we not perceive the world as flat, like a photograph? While we are not able to explain all the neural processes involved, we do know that the primary cues to visual depth are *accommodation*, *convergence*, and *retinal disparity*.

Accommodation refers to changes in the shape of the lens in the process of focusing. The lens is controlled by the *ciliary muscle*, which contracts when one views a nearby object and relaxes when one views a distant object. The action of the muscle activates kinesthetic receptors, sending impulses to the brain that can serve as cues to distance. These cues have some effectiveness for distances under six feet, but not for longer distances.

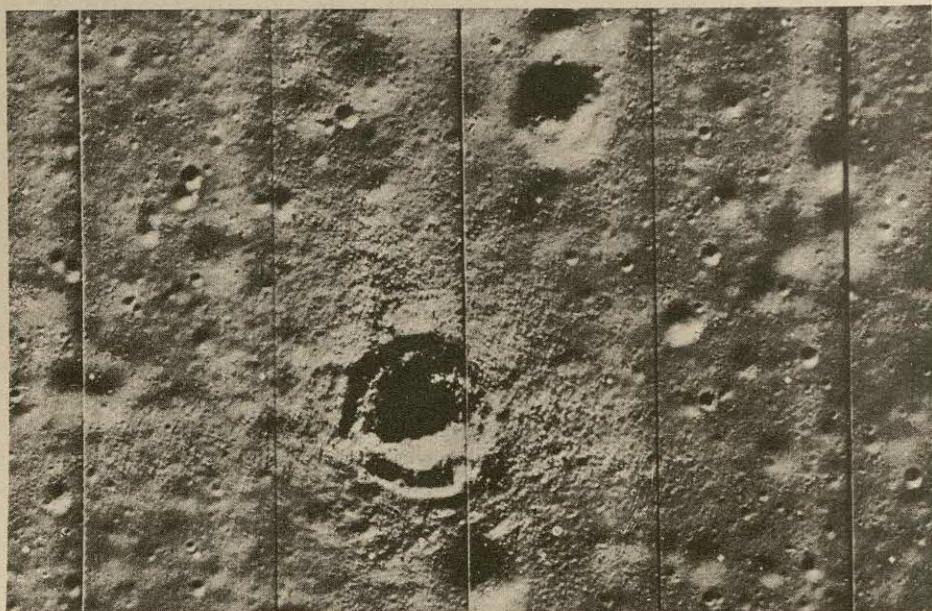
Convergence of the eyes also provides kinesthetic cues to distance. As an object moves directly toward one, the eyeballs must be rotated inward to obtain

proper focus. This can be demonstrated easily by holding a pencil at arm's length and moving it in toward the bridge of the nose. The tensions in the muscles that control eyeball position result in neural impulses to the brain. Convergence is a more effective source of distance cues than is accommodation. However, it too has little effectiveness at distances greater than 20 feet.

Retinal disparity, or *parallax*, refers to the fact that objects viewed from different angles form different retinal images. *Binocular disparity* occurs when an object is viewed with both eyes. Because the eyes are separated in space, the visual images on the two retinas are slightly different. Thus, the brain receives somewhat different patterns of excitation and somehow integrates these into a three-dimensional perception. One implication of this is that if we hold one eye closed our perception of depth will be impaired somewhat. If you test this hypothesis yourself, you probably will find that some impairment does occur, but that considerable depth perception remains. Obviously, other types of cues are also involved.

Cues to distance due to retinal disparity also occur when we change the position of our eyes while viewing an object. This *movement disparity* is more obvious, and occurs whenever we move our head from side to side or up and down while viewing a three-dimensional object, whether with one eye or two.

There are a number of other cues to depth. When one object in the visual field overlaps another, the partially covered one appears farther away. Objects seen distinctly appear closer than those seen indistinctly. For example, mountains appear closer on a clear day than on a hazy one. Closely related is the cue of texture. Objects whose surface texture is clearly apparent seem much closer than those whose surface is not seen in detail. Light and shadow also serve as cues to depth. Look at the picture below, which was made by the spacecraft Lunar Orbiter III. Now rotate your book slowly, until the picture is upside down. What happens to the appearance of the craters and "pockmarks"?



Relative motion as a cue to distance is illustrated by the perception of movement when one looks out of the window of a car or train. Nearby objects seem to go by very fast in a backward direction while distant objects appear to be moving slowly in the direction of the traveler.

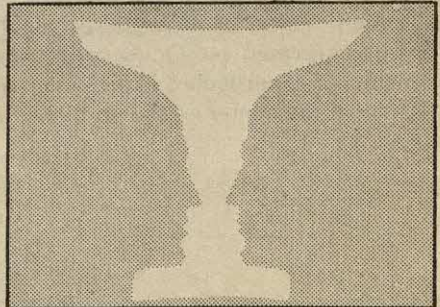
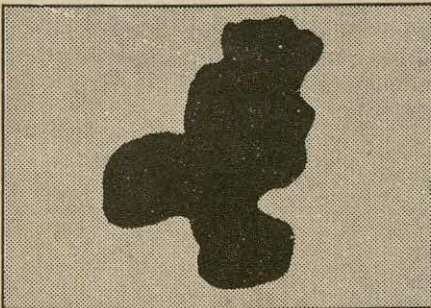
Finally, knowledge of an object serves as a cue to distance. For example, if the retinal image obtained in viewing a friend is very small, the person is seen as being far away, rather than as having shrunk.

Perception of auditory space The two questions here relate to how we perceive the distance and direction of sounds. The two major cues to direction are relative time of arrival at the two ears and relative intensity. If sound waves arrive at both ears at precisely the same time, the sound source must be either directly ahead, directly behind, or directly above. If they arrive at the left ear first, they must come from the left, and so on. Intensity operates in the same way, and relative intensity and time of arrival work together to provide directional cues.

Two cues to distance (auditory depth) are *loudness* and *timbre* (quality). Obviously, a sound produced close to one's ear is louder than the same sound at a distance. Also, sounds tend to lose their complexity as they travel (i.e., overtones travel less far). Thus, the farther away a sound is the "thinner" it will be.

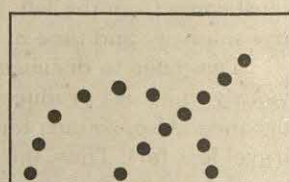
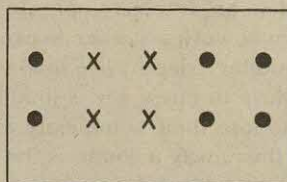
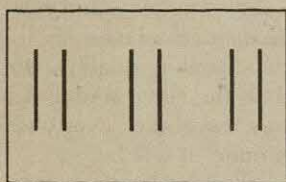
Echoes can be important in judging distance also. The most interesting example of this is in the remarkable ability of many blind persons to estimate the proximity of some obstruction. It has been shown that as a blind person walks toward a wall, he uses the echoes produced by his footsteps or the tapping of his cane as cues to its distance. If such a person approaches a wall on a heavily carpeted surface, his ability to judge its distance is reduced or eliminated.

Perceptual organization Incoming sensations are transformed in some fashion by the central nervous system into organized perceptions. One fundamental characteristic of our perception is that we see things in terms of a *figure-ground* relationship. That is, when we look at some stimulus pattern, a part of the stimulus pattern (the figure) tends to stand out against the rest (the ground). For example, in the case of the inkspot shown below, we perceive the black portion as figure and the gray portion as ground. This illustrates two characteristics of figure-ground perception. First, the figure is perceived to have a distinct form or shape, while the ground is relatively formless. Second, the figure tends to stand out against the ground. In some cases the figure-ground relationship is unstable. For a time one aspect of the pattern stands out against the other, then the situation is



reversed and what was ground now becomes figure. This is illustrated on the right below, where the figure is alternately a white vase and two gray profiles.

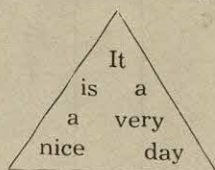
The figures below illustrate three other principles of perceptual organization. On the left is illustrated the principle of *nearness*. That is, elements of stimulus pattern that are physically near to one another tend to be perceived as belonging together or forming a subpattern. A second factor related to the way stimuli are grouped in perception is *similarity*, illustrated in the middle figure. The greater the similarity among stimulus elements, the more likely they will be perceived as going together. A third principle, that of *continuity*, is shown in the right-hand figure. The dots in that figure are seen as organized into two groups, one of which forms a curve and the other a straight line intersecting the curve. The principle here is that stimulus elements that form a continuous sequence tend to be perceived as a group.



Selective attention At any one moment the amount of sensory "input" from our environment generally is enormous. Just stop and listen for a few moments. The chances are that you will perceive a great variety of sounds, many of which you were not aware of while you were reading. The same is true of visual and kinesthetic sensations. Until you deliberately began attending to them, many of these stimuli simply were not perceived. In other words, perception involves *attention*, and attention is *selective*. A number of characteristics influence the degree to which our attention is attracted by a stimulus. Some of these are characteristics of the stimulus while others are characteristics of ourselves.

Three stimulus characteristics that are particularly effective in drawing attention are *intensity*, *movement*, and *contrast*. Other things equal, the more intense (e.g., loud or bright) the stimulus, the more likely we are to attend to it. Similarly, objects or persons in motion are more likely to capture our attention than are stationary ones. Finally, when a stimulus contrasts sharply with surrounding stimuli we are more likely to perceive it. This is the principle involved in italicizing or underlining key words in a written passage. A few minutes' reflection on the nature of television commercials will convince you that advertising agencies are well aware of these factors that influence attention.

A characteristic of the perceiver that is an important determinant of attention has been termed *set*. One's set is a result of past experience (i.e., learning) and constitutes a particular expectancy or a tendency to respond in a certain way. Glance at the sentence shown below in the triangle.



Generally readers will perceive this as "It is a very nice day," not noticing the extra "a." This is because our past experience has given us a set to see the words in this way.

Motivation also is an important determinant of attention. When we are hungry, our attention is easily attracted and maintained by the sight or odor of food, which under different circumstances might go unnoticed. Again, advertising agencies take full advantage of the motivating power of certain stimuli. Thus, bikini-clad young lovelies are shown with nearly every conceivable product in an effort to attract the viewer's attention.

An interesting phenomenon relative to attention is *perceptual satiation*. One's perception of a figure or object weakens the longer one attends to it. This is most apparent when one is confronted with a stimulus pattern that allows two possible perceptual organizations as in the reversible figure-ground pattern shown previously. At any one moment either the vase or the pair of profiles stands out. Moreover, if one focuses steadily on the center of the figure, it will spontaneously reverse due to perceptual satiation. The mechanism involved here probably is the same as that which results in the eventual "blotting out" of certain background noises that at first were quite noticeable and perhaps even irritating.

Individual differences in perception We already have illustrated the importance of past experience to the judgment of distances and to attention. Some of the most interesting examples of the influence of experience or past learning on perception come from studies comparing individuals of widely varying cultural backgrounds. For example, members of one West African tribe were found to have difficulty deriving any meaning from drawings of scenes or objects. These people simply had had no experience with realistic drawings. Members of another tribe did not exhibit this difficulty, probably because they frequently used realistic drawings in their decorative designs.

A number of years ago an investigator (Von Senden, 1932) studied the visual discrimination abilities of persons born with cataracts who were blind until the cataracts were removed during adulthood. These persons were severely deficient in the ability to discriminate among forms. Even after extensive training, some were unable to recognize the faces of persons whom they had known for years. A number of well-controlled experiments with animals have yielded similar results. There seems to be no doubt that some minimal level of early sensory experience is necessary if later perceptual abilities are to be normal.

Studies such as these make it clear that individual differences in perception are partly the result of differences in past perceptual experience and learning. Other research suggests that differences in perception also are related to individual differences in motives, values, interests, and other personality characteristics.

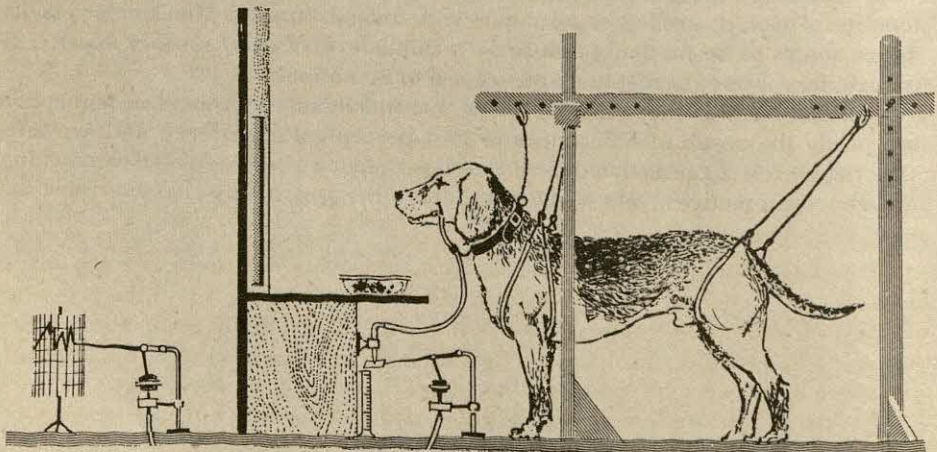
Section 4

CONDITIONING

Classical conditioning

Early in this century Ivan Pavlov, a Russian physiologist, was engaged in research on the salivary system which was eventually to bring him a Nobel Prize. His technique involved producing salivation in dogs by feeding them, and then carefully measuring the amount of salivation. While carrying out this important physiological research, he made a discovery that had a tremendous impact on the new science of psychology, an impact so great that Pavlov is better known today in psychology than in his chosen field of physiology. He noted that frequently there was a sharp increase in salivary output even before a dog was given food. He also observed that this happened only with dogs who had been used in the experiment several times; it did not occur with "new" dogs. Pavlov was intrigued by this phenomenon, and began to study it more carefully. He found that on the first occasion in which a dog was used in an experiment, the dog did not increase his salivation until given the food. Later, the dog began to salivate as soon as he saw the food. Still later, just the appearance of the experimenter was sufficient to elicit increased salivary activity. Clearly this was an example of learning. The important question at this point was "How general is this phenomenon?" If it applied only to such behavior as salivation, it would be of minor significance. Subsequent experimentation, however, led Pavlov to conclude that he had discovered the conditions

In Pavlov's early experiments, the dog was held in place with a harness while a dish of food was placed in front of him. A glass tube conducted the saliva from an opening in the duct of one of his salivary glands to a lever (center) which activated a stylus (far left); the stylus recorded the quantity and rate of salivary secretion on a revolving drum.



(based on Yerkes and Morgulis, 1909)

basic to much, if not most, learning, whether by human beings or lower animals. Stated generally, a stimulus that initially does not elicit a particular response will do so after that stimulus has been followed consistently by a stimulus that *does* elicit the response. A shock to a dog's paw results in leg flexion; a snap of the fingers does not. However, if the shock is always preceded by finger snapping, it will not be long before the snap alone will elicit leg flexion.

Now for some terminology. The procedure described usually is called *classical* or *Pavlovian conditioning*, although some psychologists use the term *respondent conditioning*. The stimulus that initially does elicit the response is called the *unconditioned stimulus* or UCS; the response that it elicits is termed the *unconditioned response* (UCR). The initially "neutral" stimulus becomes the *conditioned stimulus* (CS), and when it elicits the response (through the conditioning procedure described), the response is called the *conditioned response* (CR).

Pavlov's early work made it clear that learning can occur through the classical conditioning procedure. However, many important questions remained to be answered. Is classical conditioning strictly a laboratory phenomenon, or is it common in the everyday world? If it is common outside the laboratory, what is it that can be learned in this way? More technically, how closely must a neutral stimulus precede the UCS for conditioning to occur? Will conditioning occur if the neutral stimulus follows rather than precedes the UCS? How permanent is learning through classical conditioning? These are a few of the questions that occupied Pavlov in his later years and that have received the attention of many psychologists since that time.

Basic phenomena and laws One consistent finding is that conditioning is strongest when the neutral stimulus is presented within a second prior to presentation of the UCS. Attention is important here. If the subject does not notice the neutral stimulus, the procedure is ineffective. Also ineffective is presenting the neutral stimulus after the UCS. This is called *backward conditioning*, and most experimenters have found little or no learning with this procedure. As might be expected, both the number of conditioning trials and the strength of the association between the UCS and the UCR influence degree of conditioning.

If, after conditioning has occurred, the CS is presented a number of times and not followed by the UCS, the CR will weaken and eventually cease to occur. This phenomenon is called *extinction*. Generally, it is necessary to present the UCS occasionally in order to prevent extinction; the UCS serves to *reinforce* the CR. Related to extinction is *spontaneous recovery*. Imagine that after an experimenter has conditioned a dog to raise his leg in response to a finger snap (the CS), he gives the dog several trials in succession in which the finger snap is never followed by shock (i.e., no reinforcement occurs). Eventually leg flexion extinguishes, so that when the experimenter snaps his fingers the dog remains motionless. The next day the experimenter walks in and snaps his fingers; the dog flexes his leg again. Extinction is not complete, although it appeared so on the previous day. In order to obtain complete and permanent extinction, the extinction procedure must be repeated, probably for several successive days. Both extinction and spontaneous recovery were demonstrated and studied by Pavlov.

Pavlov also showed that a stimulus that functioned as a CS in one experiment where conditioning had been intensive can function as a UCS in another experi-

ment. For example, once leg flexion has been strongly conditioned to finger snapping, if a light flash is presented just before the finger snap, leg flexion will become conditioned to the light. This occurs even though the light is never followed by a shock, and is known as *higher-order conditioning*. However, this use of one CS to "build" another is less effective, generally producing weaker, slower conditioned responses that can be extinguished quite rapidly. Nevertheless, some psychologists believe that higher-order conditioning is involved in much human learning.

The last two phenomena that we shall mention are *generalization* and *discrimination*. Pavlov found that when a response had been conditioned to a particular CS, other stimuli similar to that CS also produced the response. Thus, if the CS is a tone of 500 cps, other low tones are likely to elicit the CR. The closer the new tone is to the CS, the more likely it is to elicit the response. This exemplifies the law of *primary stimulus generalization*. Primary stimulus generalization is said to occur whenever a stimulus elicits a response solely because of the similarity of that stimulus to the one used originally. However, if the new tone and the old tone are presented alternately, with the old tone followed by the UCS and the new tone not followed by the UCS, *discrimination learning* will occur. That is, the CR that had generalized to the new tone will extinguish, but will continue to occur to the original tone. *Response generalization* also may occur. If the dog that has been conditioned to lift his left foreleg to a finger snap has that leg fastened down, the snap may elicit flexion of the right foreleg.

What is learned? If the classical conditioning procedure results in a greater probability that a particular stimulus will be followed by a particular response, then we infer that learning has occurred. However, sometimes amount of learning is operationally defined in terms of *magnitude* of the response (e.g., amount of salivation) or speed of response. The question that concerns us here is what kinds of responses are acquired by the pairing of a neutral stimulus with an unconditioned stimulus. We have had two examples: salivation and leg flexion. Classical conditioning has been demonstrated with a number of other reflexive responses including the eye blink (with puffs of air as the UCS), the sucking response in babies (with tactile stimulation of the mouth as the UCS), and the human heart rate (with electric shock as the UCS). In general, it appears that if a response is reflexive or involuntary in nature, it can be conditioned to a wide variety of neutral stimuli through Pavlovian procedures.

More interesting, perhaps, is the fact that *emotional responses* are frequently learned through classical conditioning. This has been most clearly demonstrated with respect to *fear*. Most research on conditioned fear has been done with rats. If the floor of a compartment in which a rat is placed is electrified, the rat is likely to squeal, run about, claw at the sides of the compartment, urinate, and defecate. After a few such experiences, the rat will display much of this behavior as soon as it is placed in the compartment, and without being shocked. Since the rat is not in pain, we infer that he is afraid—that fear has become "attached" to the particular cues of the compartment. Among the best-known demonstrations of classically conditioned fear was the experiment by Watson described in your text. Watson conditioned an eleven-month-old infant, Albert, to respond with fear to a white rat that he had previously enjoyed by presenting a loud, frightening sound while the

infant was playing with the animal. After just a few trials Albert began to whimper and move away from the rat whenever it approached. Clearly Albert had learned to fear the rat. Now, what about stimulus generalization? Shouldn't objects similar to the rat produce fear also? That was exactly what Watson found. When a rabbit was placed near Albert, he responded with fear. Even a white piece of cloth and a Santa Claus mask now produced mild fear.

Watson argued that the simple sort of thing that happened to Albert is the basis of many *phobias*. A phobia is an intense irrational fear of some type of object or situation. This author once knew a young lady who became panicky at the sight of a bird close by. She related an interesting story. When she was a little girl, her older sister had nearly smothered her with a pillow. She vividly recalls that feathers were leaking out of the pillow and some were in her mouth while the pillow covered her face. This was an extremely frightening experience for her, and she attributed her fear of birds to it. Although we cannot be certain simply from her verbal report, it seems likely that her phobia resulted from this experience and can be interpreted in terms of classical conditioning.

It is important to understand that emotional responses or "feelings" such as fear can be "attached" to any stimulus that might be presented when emotion occurs. For example, if a child is frequently punished for misdeeds by being taken into his bedroom and spanked severely, the resulting fear may become conditioned to the distinctive features of his bedroom. This may be the basis for his resistance to going to bed at night. Or, if a parent (or a teacher) punishes a child severely and frequently, the parent himself may come to elicit fear (or anxiety, as it is often called). Note also that the punishment need not necessarily be physical in nature. If a child's first experiences in school are extremely unpleasant (e.g., he is ridiculed for his appearance or chastised for poor performance), the teacher and perhaps the school itself become fear-eliciting cues. Words, voice intonations, and facial expressions, through consistent association with fear-producing events, can become conditioned stimuli for fear. When young children are being trained to be careful of mother's valuable breakable objects it is common to exclaim, "No, no!" and follow this with a slap on the hand (or elsewhere). Soon the "No, no" itself produces at least mild anxiety. In this case, both the words and the way they are spoken probably become cues that produce the conditioned response.

How can we remove fear or anxiety that has become conditioned to a particular class of stimuli? We already have learned that a conditioned response can be extinguished by consistently presenting the conditioned stimulus in the absence of the unconditioned stimulus or reinforcement. In a case such as Albert's, we might simply keep presenting the rat, without ever making the loud aversive noise, until extinction finally occurs. We might begin by introducing the rat at a distance, then gradually move it closer and closer. Even more effective, we could give Albert something that produces a pleasant feeling just before we introduce the rat. This is called *counterconditioning*. Procedures essentially similar to these are used by some psychotherapists to help patients rid themselves of neurotic fears. However, experimental evidence suggests that if the conditioned fear response is quite strong, extinction may require a great many trials over a long period of time.

A final type of response that many psychologists believe is acquired through classical conditioning is *meaning*. Let's consider an example of this. Julie, a four-year-old, is familiar with many dogs, and with the spoken word "dog." Presuma-

bly, when her father tells her that there is a dog outside, the word "dog" produces some sort of visual image in Julie's mind. The particular image she has of a dog is dependent on the nature of the dogs she has known. In any event, there is evidence that when a word such as "dog" is spoken, an image is likely to be elicited. Now, in the process of teaching Julie to read, we point to the letters D O G, and say "dog." Soon these letters by themselves elicit the image of a dog that was formerly produced by saying "dog." In this fashion both spoken and written words take on meaning.

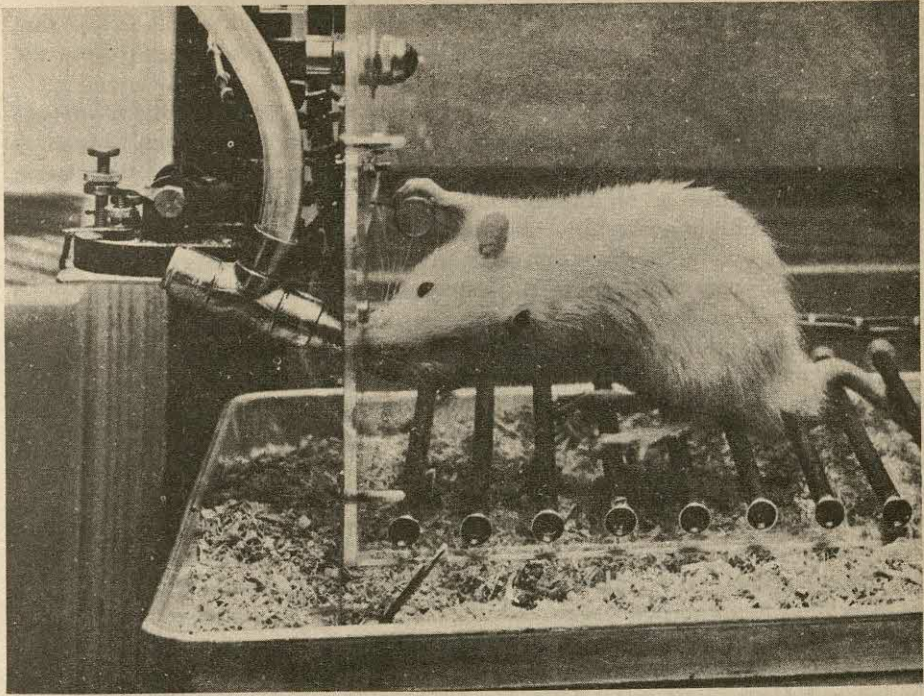
Operant conditioning

When the consequences of our behavior result in increased likelihood that the same behavior will occur in the future, we say that the behavior has been *reinforced*. In classical conditioning, the reinforcement precedes and elicits the response. In *instrumental conditioning* the reinforcement follows the response; in fact, the response is *instrumental* in producing the reinforcement. This type of conditioning is also called *operant conditioning*, because the organism *operates* on his environment to produce reinforcement.

The most common example of operant conditioning from the laboratory involves the behavior of a rat in a box known as the *Skinner box*. Such a box is shown in the photograph. It contains a lever or bar protruding from one wall, and, near it, a chute through which food can be delivered to a small tray. The apparatus is constructed so that the food delivery mechanism can be activated by pressing the bar. When a hungry rat is placed in the box for the first time, it soon will begin to explore in an apparently aimless fashion. Eventually it will "accidentally" lean against the lever, and out will pop some food, which will be consumed quickly. Before long the lever will be pressed again and more food consumed. Soon the rat is alternately pressing and eating at a rapid rate. The rat has been conditioned or taught to press a bar to obtain food. The bar pressing that now occurs so regularly is termed *operant behavior*. The conditioned response in this case is the bar pressing response; the reinforcement is the food. However, the situation is not quite as simple as it may seem, as another example will illustrate.

Another common laboratory procedure is to place a rat in one end (the start box) of a straight alleyway with food placed out of his sight in the other end (the goal box). When first placed in this situation, a rat is likely to explore the alleyway gradually. It may take several minutes for him to reach the goal box and eat the food. However, if he is now removed from the goal box and again placed in the start box, he will reach the food much more quickly. Soon he takes off running immediately upon being placed in the start box. Now, what has the rat learned? To run? Hardly, since that rat probably has run many times prior to this training. The rat has not learned to make a new response; it has learned to make an old response in a new situation.

The following notation may be used to describe the conditioning procedure: Stimulus 1 (S_1) $\rightarrow$ Response (R) $\rightarrow$ Reinforcing Stimulus (S_R). In the example just described, S_1 represents the particular cues present in the start box to which the running response (R) is conditioned. The reinforcing stimulus is the food. However, there still is one element missing. Imagine that a rat who has received the



This is one example of the type of apparatus known as the "Skinner box." Here the rat is rewarded for pressing a bar by a pellet of food which is delivered by means of the plastic tube at the left. This box can also be used in experiments involving negative reinforcement (see p. 556), since its "floor" is a metal grid that can be electrified to produce a shock. There are various types of Skinner boxes designed for use with different animals. In a fairly common type designed for pigeons, the bird must learn when to peck at a stimulus device on the wall of the box, or perhaps even choose the correct stimulus from a group of two or three.

alleyway training is allowed to eat as much as it wishes just before being placed in the start box. Under these circumstances the rat is likely to traverse the alleyway quite slowly, if at all. Would we now say that the rat had unlearned or forgotten what it had learned before? We could test this by waiting until the rat was hungry again, then placing it in the start box. Now the rat would quickly run down the alleyway to the goal box.

Here we see the distinction between learning and performance. Learning was *necessary* to produce increased running speed in the alleyway, but it was not *sufficient*. The missing element was *motivation*, or more specifically, *drive*. Operant behavior is a function of at least two types of elements: a learning element and a motivational element. The learning element often is called *habit*, and may be thought of as an association between a stimulus and a response. *Drive* refers to a state of activation that interacts with habit to produce behavior. Habit and drive are abstract concepts—they have never been observed directly. Rather, observations of behavior such as that of the well-fed rat have led psychologists to infer the existence of these two processes. Undoubtedly the reader has made similar observations. During the baseball season an exhibition game sometimes is played. Typi-

cally, the players are not at their best in such games. They fail to make plays that the day before were made with apparent ease. The habits are present, but the drive level is reduced.

Reinforcement can be classified as *positive* or *negative*. A positive reinforcer is something that an organism will attempt to approach or attain, such as food. A negative reinforcer can be thought of as the reduction of unpleasant stimulation from something which an organism ordinarily attempts to escape, such as pain or fear. Some learning theorists have argued that all reinforcement consists of a reduction in drive, as food reduces drive based on hunger. However, this is a theoretical position about which there is considerable disagreement, and which need not concern us here. The point is that the reinforcement of responses is a powerful means of controlling behavior, whatever mechanisms may be involved.

One subclass of conditioning that involves negative reinforcement is called *instrumental escape conditioning*. If a rat is placed in a closed compartment and immediately is shocked, it will exhibit the fear responses described earlier. Now, imagine that we then make it possible for the rat to escape by inserting a lever that opens a door to the outside. Soon the rat will learn to press the lever, thus escaping the shock. In this situation pain is the source of drive, and reduction in pain the reinforcement.

Imagine now that with a second rat we do exactly the same, except that the shock is delayed until five seconds after the rat has entered the compartment. The initial result is that through classical conditioning fear becomes attached to the cues of the compartment. Next we insert the lever. Soon the rat will learn to press the lever and leave before the shock comes on, i.e., it avoids shock. This is termed *instrumental avoidance conditioning*. What is the source of drive for this avoidance behavior? It cannot be the pain, because the rat has avoided the pain. What was the reinforcement? It could not be pain-reduction because the pain was not present. This is one of many examples in which fear apparently provides the drive and fear-reduction the reinforcement in instrumental or operant conditioning. Note, however, that the fear was present due to classical conditioning. Thus avoidance training usually involves both classical and operant conditioning in a two-stage process. Although additional instances of avoidance conditioning cannot be considered here, we suggest that you think about these yourself. For example, why do many children resist going to school? What processes are involved in training children to resist temptation?

Reinforcement also is related to motivation. If you work very hard on a class assignment, and the instructor who evaluates it makes a point of praising your work, you will be provided with greater *incentive* (motivation) on the next assignment than if the instructor had not made any comment. It isn't that you learned more, but that you will try harder. Similarly, a rat that has been reinforced with food for running down an alleyway will have greater incentive to run quickly the next time than will a rat that has not been reinforced for running. Both rats *can* run quickly, but only one does. We shall consider the topic of motivation in greater detail in Section 6.

Basic phenomena and laws As with classical conditioning, consistent omission of reinforcement results in the extinction of operantly conditioned behavior. In fact, one of the most frequently used measures of strength of conditioning is the

number of nonreinforced trials that are necessary to extinguish the response. Other common measures of *response strength* are speed of responding, and, in situations where alternative responses are possible, the proportion of trials on which the correct response occurs.

Stimulus generalization is found in operant conditioning also, as is response generalization. In fact, everyday examples of stimulus generalization are innumerable. Consider the two-year-old girl who has been reinforced consistently for saying "Hi, Daddy" when her father comes home from work. Until conditioned discrimination occurs, she is likely to respond with "Hi, Daddy" to the milkman, the mailman, etc. Conditioned discrimination develops after the child has consistently received no reinforcement for this response except when it is applied to her daddy.

The greater the *amount* and the *quality* of reinforcement following a response, the more rapid will be conditioning. The timing of reinforcement also is extremely important. Particularly with young children and lower animals, an interval of more than a few seconds between response and reinforcement markedly retards conditioning.

The effects of differing schedules of reinforcement on operant responding are particularly interesting. Once a response has been conditioned to occur in a given stimulus situation, the rate of responding can be maintained at a high level without reinforcing every response. This has been demonstrated most clearly with bar pressing by rats in the Skinner box. Once the response is established, it will continue at a high rate even if reinforcement is given only following every fifth or tenth response. If reinforcement is provided on an irregular intermittent basis, the response will become very difficult to extinguish. For example, say that an experimenter gives rats 50 trials in which they are placed in the start box of an alleyway and allowed to traverse the alleyway. For half the animals he puts food in the goal box on every trial (continuous reinforcement), while the remaining rats find food in the goal box on only 25 trials, and the particular trials when reward is present are determined randomly. This procedure is often called *intermittent* or *partial reinforcement*. If we examine the behavior of the rats during these 50 trials, we find that the running speed of the continuously reinforced rats is greater at first, but by the fiftieth trial, the two groups are similar in running speed. After the fiftieth trial, all the rats are given as many nonrewarded trials as are required to produce extinction. It is during this extinction period that a striking difference will be found. The running speed of the continuously reinforced rats will decrease sharply, while the partially reinforced rats will continue to run rapidly for a much longer time. In other words, partial reinforcement produces increased persistence in the face of nonreward, i.e., increased resistance to extinction. This *partial reinforcement effect*, as it is called, is a stable phenomenon, whether with rat or with man.

Conditioning in human beings Some psychologists believe that nearly all behavior that we usually think of as "voluntary" has been acquired, or at least influenced, by past reinforcement. Of course things are not as simple as in the laboratory, but the basic processes are the same. For example, we have described instances in which the organism either did or did not make a particular response. However, in most situations that face us we must select our response from a number that are possible. Thus, for example, the question is not whether or not you

will clothe yourself before going to class, but rather what clothes you will put on. This is the notion of *response competition*. Other things equal, the response that will be made is that which has been strengthened most by past reinforcement. Sometimes, however, the strongest response is not the most desirable one. Parents often face this situation with their children's behavior. The trick is to make a desirable response more powerful than an undesirable one. From what we have learned this suggests a two-pronged attack—weakens the strong, undesirable response through nonreinforcement, while simultaneously strengthening the desired alternative through reinforcement. This simple notion is the basis for the psychotherapeutic approach of many psychologists, as well as for certain techniques used by many skillful parents and teachers.

We should also note that a wide variety of events and objects can serve as reinforcers. Many of these have no direct connection with our biologically determined needs. For example, the approval of others is among the most powerful reinforcers of human behavior. Some psychologists theorize that such reinforcers acquire their reinforcing properties through association with events that are inherently reinforcing, such as food. The latter are termed *primary reinforcers*, and those assumed to have been acquired through association are called *secondary reinforcers*. Classical conditioning is thought to be involved in establishing a stimulus as a secondary reinforcer. To illustrate, if the mother's soft voice and smile often accompany feeding, then the pleasant feelings elicited by feeding may become conditioned to the mother's voice and smile. Now the voice and smile themselves are reinforcing. Other examples will be found in the section on motivation, where the topic of reinforcement is treated in greater detail.

One characteristic of much of the human behavior that we observe is that responses occur in sequence. The establishment of such a sequence of responses often is referred to as *chaining*. Even walking down the street can be conceptualized as a chain of motor responses, with each response being guided by the sensory (kinesthetic) feedback from the previous response. For the experienced walker it may be difficult to think of walking as a chain of discrete responses, but observation of a fifteen-month-old child may make this point more clearly. Many kinds of behavior (e.g. typewriting, speaking, driving an automobile) can be conceptualized in terms of a response chain. The development of such a chain requires (a) that individual responses be acquired, and (b) that these responses be linked together so that the occurrence of one results in the next and so on, much as in the case of falling dominoes.

One of the more interesting operant conditioning techniques is termed *shaping*. Suppose a father wishes to teach his little boy to throw a ball to him. The task is to begin with the child's first primitive attempt and gradually *shape* this into the desired throwing response by the skillful use of reinforcement. Thus, at first Dad will smile and say "That's fine, Danny" no matter how wild the throw. A little later Dad will give his approval only when the ball is thrown with an overhand motion. Then he may concentrate on accuracy, providing reinforcement only when the ball is thrown in his general direction. Finally, only when the ball travels to him in the air will approval be given. Shaping is a common practice with respect to many kinds of responses. Another example is speech training, where at first we will provide a child with water when he says "Wawa," but later withhold the water until the correct pronunciation occurs. Thus we effectively shape the speech of our children.

VERBAL BEHAVIOR

Verbal learning

Research concerned with *verbal learning* has supplied a great deal of information about conditions that affect learning and forgetting. In studying learning, psychologists generally have used simple verbal materials: lists of words or nonsense syllables. Nonsense syllables (e.g., "ZAM") are particularly useful when the experimenter wishes to study the learning of a verbal unit with which the subject is totally unfamiliar.

Three "types" of learning of verbal units have received the most attention. First is what we might call the rote memorization or learning of one or more units, or *free learning* as it is often termed. Typically, a subject is simply asked to learn, in any order, a list of words that is presented to him. Second is *serial learning*, in which the subject is presented with a list of words which he must learn in the order in which they are presented. Third is *paired-associate learning*, in which the subject is required to learn the correct response word for each of several stimulus words that are presented to him. This is analogous to what one does in learning the French equivalents of English words. Paired-associate learning may be thought of as a two-step task. First the subject must learn what the various response words are. Then he must learn with which stimulus word a particular response word belongs. The first stage, response learning, is similar to that involved in free learning. The second involves forming an association.

Several variables have been found related to the learning of verbal units. One of these is *meaningfulness*, generally defined in terms of the number of other units that are associated with a particular word. For example, for most people, more words are associated with "cat" than with "cam," so "cat" is considered more meaningful. In free learning, meaningfulness is strongly related to rate of learning (see your text). Meaningfulness of response terms also is strongly related to rate of paired-associate learning. This is due primarily, if not entirely, to the fact that the response learning stage is much easier with high-meaningfulness responses. An increase in the meaningfulness of the stimulus words also has a positive effect on overall learning rate, but the effect is relatively small, since subjects do not have to recall the stimulus words.

When words in a list are similar to one another in meaning (e.g., cold, frigid, icy) or when they all are instances of the same concept (e.g., horse, cow, sheep), free learning is facilitated. With paired-associate learning, the situation is more complicated. Although the response-learning phase is made easier by high similarity of these types between response terms, the effect on the associate phase is just the opposite. That is, the subject can learn more quickly what the various response terms are, but since they are so similar, he is more apt to become confused as to what goes with what. Thus, the effect of increasing similarity among the re-

sponse words sometimes will be to facilitate paired-associate learning, and sometimes to retard it, depending on other factors involved. However, increases in similarity of *stimuli* nearly always result in slower paired-associate learning.

In serial learning, one of the most powerful variables related to rate of learning is the position of the item in the list. The first few items are learned most rapidly, the last few items next most rapidly, and the items just beyond the middle, least rapidly. This phenomenon is known as the *serial position effect*. One investigator (Jensen, 1962) proposed that a single word can be considered as a serial list of individual letters. To spell a word correctly, the letters must be learned in one particular sequence. He then demonstrated a serial position effect of letters within words. That is, he found that spelling errors were greatest for letters near the middle, fewer for letters at the end, and fewest of all for the beginning letters of words.

Generally, learning is more rapid when subjects are instructed to learn words than if they are not so instructed, even though both groups of subjects are exposed to the words for an equal amount of time. In technical terms, *intentional learning* is more effective than *incidental learning*. However, when the incidental learners are forced to *pronounce* the words, the difference between the two groups decreases or disappears (Mechanic and Mechanic, 1967). Thus, it seems that pronouncing, which includes saying the word to oneself, is an important factor in learning of this type.

Perhaps the single most powerful variable affecting how well something is learned is the amount of *time* spent practicing. The fact that learning is greater when words are presented at four-second intervals rather than two-second intervals is due to the greater implicit practice or rehearsal that is possible with the longer interval.

Transfer When learning of one task affects learning of a subsequent task, *transfer of training* is said to have occurred. Since this is likely to occur in most human learning, transfer receives a good deal of attention from psychologists. The effects of past learning may be either to facilitate present learning (*positive transfer*) or to retard it (*negative transfer*).

Most experimental studies of transfer have made use of the paired-associate task. In the simplest case, one group of subjects learns two paired-associate lists (List 1 and List 2) in succession. A second group learns only List 2, and the two groups are compared on their performance on List 2. If the second group performs best, negative transfer from List 1 to List 2 has occurred. If the first group is superior, the transfer has been positive. In one type of study using the approach just described, the stimulus words in the two lists given to one group are the same but the response words are different. This is analogous to first learning the German equivalents of ten English words, then having to learn the French equivalents of these same words. In most such cases, negative transfer results. This is not surprising if the situation is considered in terms of response competition.

A second common type of transfer study is one in which the response words remain the same but the stimulus words in the two lists are different. Here positive transfer is the most common finding. Recall that paired-associate learning involves both a response-learning and an associative-learning stage. When the responses for List 2 are the same as those already learned for List 1, the subject can "by-pass" one of the stages in learning List 2. In this situation, however, the

greater the degree of learning of List 1, the less will be the positive transfer. If the degree of first-list learning is very great, negative transfer is likely to result.

A number of psychologists have become primarily interested in cases of transfer in which *mediation* is involved. Suppose that on the first list subjects learn to say "gallop" in response to "desk," and on the second list, they must learn to say "horse" when they see "desk." We already have stated that when the stimuli remain the same but the responses change, negative transfer is the most common result. However, in cases like "desk-gallop," "desk-horse," this is not true. In fact, positive transfer occurs. The most plausible explanation for this is that as the subject begins to learn the second list, when "desk" appears, he thinks or says to himself "gallop," and this leads him to (mediates) the correct response, "horse." The basis for the mediation is the fact that there is a strong association, due to past learning, between "gallop" and "horse." That such an association exists is clearly shown by the results of word association tests.

Learning to learn is a term descriptive of the positive transfer that occurs as a result of practice in cases where there is not a similarity of particular stimulus or response. For example, it has been shown that a subject's performance improves on successive word lists even when the lists are extremely dissimilar. A similar phenomenon has been reported for nonverbal problem-solving tasks by Harlow (1949), who found that performance gradually improved with practice on problems of the same general type, even though no specific similarity between the successive problems existed. That is, the subject learns how to go about this kind of learning.

Retention Since your text has treated the topic of retention in considerable detail, it will be dealt with very briefly and incompletely here. Our concern will be with factors that influence degree of forgetting.

Let us first examine individual differences in intelligence as they relate to retention. Surely fast learners retain more than do slow learners—or do they? If we were to present a list of 20 words just once to a group of fast learners and to a group of slow learners, and then on the following day ask all the subjects to name the words, we would find better performance by the fast learners. Could we conclude that this was due to more forgetting by the slow learners? If we did, we would miss the essential point, namely, that the fast learners had learned more (by definition) given the same amount of practice. To date, there is no evidence that individual intellectual differences are appreciably related to rate of forgetting.

Two factors that strongly influence the amount of forgetting of a single list of verbal units are (a) the time interval between practice and the retention test, and (b) degree of original learning. Meaningfulness *seems* to increase retention, but that is only because more meaningful material is learned to a higher degree in the first place. The same is true for a number of other variables that often are thought to influence forgetting. The moral for the teacher or parent seems clear: if you want to maximize retention, maximize learning.

Language and thought

The complex communication system that we call *language* is among the most interesting areas of psychological study. A major reason for this is that language is

very closely related to human thinking. Language is not only a system by which individuals communicate with each other; it also functions to facilitate thinking and action for the individual. That is, it is important in the individual's communication with himself.

Human speech constitutes man's most common form of language use. Generally, it is from an individual's own speech behavior and his understanding of the speech of others that we judge his degree of language competence. Speech and language are not identical, however. After all, many individuals whose speech organs are defective or who have been deaf from birth nevertheless possess a high degree of language competence, as may be seen by their understanding and use of written symbols. However, both in the history of man as a species and in the normal course of individual development, understanding and producing speech precede understanding and use of written symbols. Thus, we gain much of our understanding of language and linguistic processes through the study of human speech behavior.

In order to understand and produce human speech one must understand the meanings of the symbols or words being used. The study of word meanings is termed *semantics*. We already have seen that words can acquire meaning through classical conditioning when they are paired consistently with particular objects, events, or other words. We can learn a great deal about language and thought by studying word meanings. One technique long used in such study is the *free-association* test. A word is presented and the individual is asked to respond to it as quickly as possible with the first word that comes to mind. As a result of using this procedure with large groups of people of various ages we now know the most frequent *associates* (words given as responses) for a large number of words. We also can trace changes in these associates from early childhood to adulthood. It is assumed that the responses to words in a free-association test are good clues to the meanings of the words, and also reveal something about the way individuals think. For example, "horse" is a very common response by young children to the word "gallop." This suggests that when a child hears or sees the word "gallop" he is likely to think of "horse," even though he does not necessarily say the word aloud. We further assume that this internal verbal response may lead to another, and that one to still another, just as in the case of chains of overt responses that we considered in our discussion of response chaining. Thus, for example, "gallop" may elicit "horse," which in turn elicits "cow," which may remind you of "milk," and finally you realize that it has been some time since you have eaten. So you put down your book and get a snack. This is an example of an overt response (getting a snack) to an overt stimulus ("gallop") that was *mediated* by a chain of internal verbal responses ("horse," "cow," and "milk"). Much complex human behavior probably is mediated in this fashion. Of course the internal chains often are much more complex, as in the case of "thinking through" a difficult problem, and much remains to be learned about these processes. Nevertheless, the study of the nature and development of word associations has helped us increase our understanding of language and thought, and of how these develop.

Semantics is only one aspect of language. Another is *syntactics*, the study of the rules by which words are combined into larger meaningful units, particularly into sentences. Suppose that an individual had learned the meanings of the words "kangaroo," "mule," and "kicked," but had no knowledge of syntactical rules. He then would not be able to distinguish between "The mule kicked the kangaroo,"

and "The kangaroo kicked the mule," where the words in the two sentences are identical but the meanings are quite different. Or consider the sentences "The mule kicked the kangaroo," and "The kangaroo was kicked by the mule." Here the words are not identical but the sentences are equivalent in meaning. Again, knowledge of syntactical rules is necessary in order to recognize the equivalence or to transform one sentence into the other. The fact that we can understand and create sentences such as these, even though we never have seen or heard them before, demonstrates that we have learned a highly complex set of syntactical rules or patterns, despite our inability to state them precisely.

In many cases neither the word meanings nor the syntactical cues in a sentence are sufficient for us to understand the meaning of a sentence. Take the sentence "They are frying chickens." Does this describe the type of chicken or does it describe what is being done with the chickens? Generally in such cases the apparent ambiguity is removed either by the vocal emphasis or stress given certain of the words or by contextual cues. In this case, all we would need to know is what question is being answered.

The development of verbal behavior

It appears that during the first few months after birth the human infant produces all the sounds that the human voice is capable of producing. That is, infants do not have to learn to make an increasing variety of sounds—this just "comes naturally." What does change through learning is the relative frequency of different sounds and the overall frequency of vocalizing. Sounds that resemble those in the spoken language used around the child increase in frequency while other sounds decrease in frequency. The overall vocal output also increases. These changes can be accounted for, in part, in terms of operant conditioning. Parents generally respond with approval (cuddling, laughing, etc.) when their baby begins babbling, resulting in an increase in vocalizations. Moreover, parents are likely to give more affection and approval when the sounds made resemble spoken words in their language than when they do not. In fact, when the infant is a bit older, say 18 months, "ga-ga" is not likely to be reinforced at all. There are other kinds of pay-offs to improved speech. The better the speech, the better able is the child to communicate his needs and desires, and thus improve his chances of getting what he wants. For these reasons certain speech habits are strengthened through reinforcement while others are extinguished through nonreinforcement.

Also, as any parent knows, infants are great imitators. Some psychologists believe that one reason infants imitate the speech sounds of their parents is that the parents' speech sounds have become secondary reinforcers through association with feeding, holding, etc. Thus, producing sounds similar to those made by Mother brings some degree of satisfaction even when Mother is absent.

Recall that earlier we discussed the role of classical conditioning in the acquisition of meaning. In our example we described how the letters D O G, through association with the spoken word "dog," came to elicit the image formerly elicited only by the spoken word. This image constituted the meaning, or at least part of the meaning, of the word, and can be thought of as an internal response—in this case, a sort of visual thought. With infants and very young children the world probably is represented largely by images. That is, a very young child may not be

able to describe what he has seen, but is able to "picture" it. During early childhood, words begin to replace images as the dominant form in which we represent reality, particularly when we deal with abstract concepts or complex problems.

Before their first birthday most infants have some understanding of the meanings of several words, and within a few months they can produce several meaningful words. At first progress seems quite slow, but from about two to four years of age the rate of vocabulary growth is tremendous, so that by first grade many children can understand and use several thousand words. Sometimes, however, the vocabulary of children is misleading. For example, one of the first words learned by many children is "dog." Obviously the infant who says "doggy" is not using that word in its full conceptual meaning—as denoting a member of a particular class of four-legged domestic animal of the canine family. Instead, he probably first uses it as a proper name, as we would use the name "Rover" or "Spot."

The rapidity with which children learn to follow grammatical or syntactical rules in constructing sentences is very impressive. Even by three years of age many children seem to have acquired a great many rules for combining and transforming words. It is quite common for children under three to say "I goed to the store with Mommy." This error occurs not because the child has heard such a sentence before, but because he is following a rule to the effect that, to transform a sentence into past tense, "ed" should be added to the present-tense verb. The order of words in children's sentences also conforms remarkably well to adult usage, even for three- and four-year olds. Just how children learn to follow the syntactical patterns characteristic of their language is not well understood at present. Certainly it is not a matter of formal instruction. Nor do simple conditioning principles seem to account entirely for these developments.

During the preschool and early school years there appears to be a rapid increase in the role of internal verbal behavior in learning, thinking, and problem solving. There is a shift toward increased verbal mediation of behavior. Vocabulary also increases, so that the average college student probably can use correctly some 30,000 words and knows the meanings (roughly, at least) of more than 150,000 words. Of course, for persons of limited educational background, vocabulary growth is much slower. In fact, one characteristic of children from impoverished environments is a general deficit in verbal behavior. Since verbal behavior is so closely related to thinking, language retardation may result in a generally lower level of intellectual functioning. For this reason special programs such as Head Start place considerable emphasis on early language training.

Section 6

MOTIVATION

The study of motivation centers on problems derived from two kinds of observations that have been made by all of us. First, on some occasions organisms are more active and aroused, their behavior more "energized," than on other occa-

sions. Second, much of our behavior seems to be directed toward the attainment of particular goals. Questions related to these observations have stimulated a great deal of research and theorizing. This section will deal with research findings and, to a lesser extent, theories that seem particularly relevant to the student of human motivation. Theoretical controversy will be avoided, although any discussion of motivation is bound to be colored somewhat by the theoretical biases of the writer.

Physiologically based motivation

Proper body functioning depends on the maintenance of a complex physiological balance or equilibrium. When this equilibrium is upset an *organic need* is said to exist, and processes are activated to restore the balance. The tendency of the organism to perpetuate or restore physiological equilibrium is termed *homeostasis*. Temporary disequilibrium (existence of an organic need) often results in a general increase in arousal, an energizing of the organism, to which the term *drive* has been applied. A drive that results from some physiological disequilibrium and is independent of experience (learning) is called a *primary drive*. Examples of primary drives are those associated with hunger, thirst, pain, and sex. Drive is characterized by increased activity, and if the activity results in a reduction in drive level, the behavior is reinforced. For example, if a hungry rat finds food at the end of an alleyway, consumption of the food reinforces the behavior (instrumental response) that led to it. In the case of primary drives, anything that is capable of reducing the drive is a potential reinforcer, and thus can act as an *incentive*. Although drive reduction results in reinforcement, the theoretical question of whether drive reduction is *necessary* for reinforcement to occur is, at this point, an unsettled one.

In treating specific physiologically based motives, major emphasis will be on those which appear to be most frequently involved in complex human behavior. For example, hunger and thirst will be treated very briefly despite the fact that a great deal of productive research by both physiologists and psychologists has centered on these drives.

Hunger The feeling of hunger generally is accompanied by stomach contractions. One might assume, then, that the absence of food in the stomach produces stomach contractions, which in turn produce the feeling of hunger. However, it is not that simple. For example, if blood from a hungry dog is transfused into a dog that has just eaten, stomach contractions begin in the latter. If blood from a well-fed dog is transfused into a starving animal, the result is a reduction in stomach contractions. The nature of the link between blood chemistry and stomach contractions is not clear at present. Moreover, the feeling of hunger may occur in the complete absence of stomach contractions, as it often does in people who have had their stomachs removed because of injury or disease. It has also been shown that stomach contractions can be evoked by direct electrical stimulation of certain portions of the hypothalamus (a part of the brain stem), and stopped by the stimulation of other portions. Thus it is evident that the brain, too, plays a part in the hunger mechanism.

A number of studies have shown that organisms have specific hunger needs,

each requiring a particular food for satisfaction. For example, rats which have been deprived of foods containing calcium will show a preference for food high in calcium, and high-calcium foods will be more effective reinforcers in a learning situation. In one study (Young, 1933), farm animals were allowed to select from a wide variety of foods. The animals did very well from a dietary point of view. An earlier experiment (Davis, 1928) had shown that human babies who were allowed to select from a variety of raw and cooked foods generally chose well-balanced diets. One child with a vitamin D deficiency even voluntarily selected cod-liver oil, which is high in vitamin D. Unfortunately, some dietary deficiencies do not produce a specific hunger that leads to selection of the needed foods.

Despite its biological base, eating is strongly influenced by experience. Learning plays a particularly important role in the eating behavior of human beings. For example, an individual who has once been violently ill after eating a lobster dinner may refuse to eat any type of shellfish, whether or not this was actually the cause of his discomfort. Also, consider the elaborate ritual that surrounds dining in our culture. Even the timing of meals is culturally influenced. An extreme example of the power of cultural factors is seen in the case of many families in India who, during famines, have chosen to die of starvation rather than eat the sacred Brahman cattle.

Finally, eating behavior is influenced by external stimuli, as well as by the internal physiological need. Frequently a person will enter a restaurant with the intention of having only a light meal, then change his mind after watching a mammoth steak being served at the adjacent table.

Thirst As with hunger, the physiological mechanisms responsible for maintenance of the proper water content in body tissue seem to be localized in the brain and the blood. Degree of dryness in the oral cavity acts as a cue for thirst, as do stomach contractions for hunger. However, when mouth dryness is increased by removal of the salivary glands, there is no corresponding increase in water consumption. Again, learning plays a role in drinking behavior. In fact, some people boast of never touching a drop of plain water, and their behavior adds credence to their claim.

Sex The sex drive is similar to the hunger and thirst drives in that it is based on physiological mechanisms, there are certain incentives associated with it, and some instrumental act is necessary for its reduction. However, there are at least three interesting differences between the sex drive and these other physiologically based drives. First, reduction of the drive is not necessary for survival. Second, the strength of the sex drive varies sharply with age, as sex glands increase and decrease in activity. Finally, and perhaps most important, cultural influences are much greater in regard to sexual behavior. In fact, in our society the social taboos and laws have frequently stood dead against behavior which, in lower animals and even in many so-called primitive cultures, would be the usual means of attaining sexual satisfaction. This is particularly true in the case of adolescents in our culture. As a result of these factors, sexual motivation and the resulting behavior is psychologically much more complicated than in the cases of hunger and thirst.

The main physiological influence on the strength of the sex drive in the female is the sex hormone *estrogen*, which is secreted into the bloodstream by the

ovaries. Strength of the male sex drive is influenced by *androgen*, a hormone secreted into the bloodstream by the testes. The production of the sex hormones increases sharply when individuals become mature at puberty. This is not to say that the sex drive is not present earlier. In fact, manifestations of the sex drive are consistently observed even during infancy. However, with puberty comes a significant increase in the strength of that drive. Brain functioning also is linked to sexual behavior, particularly in the case of animals high on the evolutionary scale. Destruction of certain sections of the cerebral cortex will abolish sexual behavior, while destruction of other sections will increase it. Different aspects of sexual behavior (e.g., sexual arousal, ejaculation) are linked to different areas of the brain.

In lower animals, such as fish, sexual behavior is largely *instinctive*. That is, it is stereotyped behavior that has been influenced minimally, if at all, by learning. As we move up the evolutionary scale, the degree to which hormone secretion influences sexual behavior decreases. When the ovaries of the white rat are removed, sexual behavior is abolished. With chimpanzees, the effect is not as great, and many human females whose ovaries have been removed report no loss in sexual desire. Similar findings have been reported with respect to castration in the male.

As was mentioned earlier, cultural factors have an enormous effect on the sexual behavior of human beings. Although the adolescent is fully mature sexually, societal pressures deny the opportunity for normal sexual gratification, particularly in the case of females. One result of this is that various substitute behaviors are acquired, such as masturbation and extended petting without intercourse. Another result, in many cases, is a high degree of *conflict* between the desire for normal sexual gratification and the fear of the consequences of such behavior. This fear is not only of such outcomes as pregnancy and venereal diseases, but also involves *guilt*. Freud emphasized internal conflict as characterizing neuroses, and attributed such conflict primarily to repressed sexual wishes. Although most psychologists today would not wholly agree with Freud, there is no question that severe conflict can, and often does, involve anxiety regarding sexual desires and behavior.

Where human behavior is concerned, it is not easy to determine the major motives that are operating. Often we are fooled, and this is particularly true with respect to behavior that appears to be sexually motivated. Why does a boy try to date the "sexy" blonde down the street? Perhaps for sexual gratification. Perhaps because she "turns him on." But it could also be that he is hoping to impress his friends by proving that he is worthy of the attentions of so desirable a young lady. Of course, in most cases a number of factors are probably operating.

Pain Pain is both a sensation and a producer of drive. It differs from the other drives we have been considering in that they are *appetitive* whereas pain is *aversive*. Appetitive drives are reduced by approach and consumption; pain is reduced by escape from the pain-producing stimulus. We mentioned earlier that pain-reduction constitutes reinforcement for whatever behavior preceded it, and is a form of negative reinforcement. Perhaps the major importance of pain from a psychologist's viewpoint is in the fact that it can provide the basis for conditioned fear. We have already seen this in our discussion of classical conditioning and of avoidance behavior.

Reactions to painful stimulation can be influenced to some degree by experience. For example, Pavlov found that the normally violent reaction of dogs to moderate electric shock to a paw could be eliminated by consistently following the shock with food. Attention also is important. Athletes often are not aware of a painful injury during the course of a game while their attention is so concentrated elsewhere.

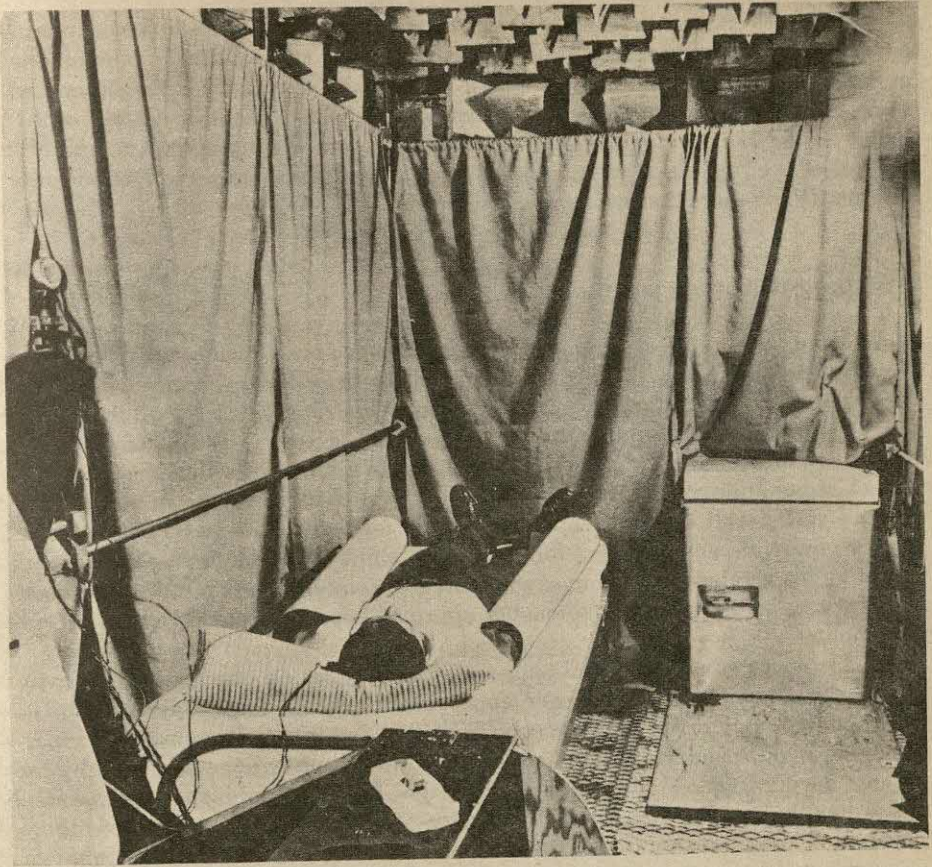
Cognitive motivation

The term *boredom* is a word that we generally use to mean that we want either an increase or a change in stimulation. Does this mean that there is a "stimulation-seeking" drive of some sort? This notion received little attention from experimental psychologists until about fifteen years ago. Recently, however, questions related to boredom, curiosity, and exploratory behavior have received considerable attention.

Several studies (e.g., Harlow, Blazek, and McClearn, 1956) have demonstrated that monkeys will persist for long periods of time in solving mechanical puzzles without receiving any apparent reinforcement. Some have interpreted these results as showing the presence of a *manipulatory drive*, for which the manipulative behavior itself is reinforcing. In another series of studies (Butler, 1953) it was shown that monkeys would solve problems for no other reinforcement than to be given a peek outside their box. Thus, *visual exploration* constituted an incentive and suggested the presence of something that might be termed *visual curiosity*. Evidence for visual curiosity comes also from observations of infants. Frequently a crying infant will cease crying when placed in a more upright position from which he can see a greater portion of his environment. He can be observed to gaze intently about him. Results of studies indicate that such qualities as *novelty* and *complexity* in visual stimuli are particularly likely to elicit visual exploration.

Among the most interesting experiments are those involving *sensory deprivation*. In one such study (Bexton, Heron, and Scott, 1954) college students were paid twenty dollars a day to do nothing but lie on a comfortable bed. Their eyes were covered so that they could see diffuse light but not patterns. They were fitted with earphones through which came a constant hum, and their arms were enclosed in tubes to reduce tactile stimulation. These conditions were maintained constantly except for eating, elimination, and psychological testing. Few subjects could stand these conditions for more than two or three days. Their thinking became incoherent, and some began to have hallucinations. Most of all, the desire for stimulation of any kind became overwhelming. Apparently there is some minimal level of sensory stimulation (or perhaps variation in sensory stimulation) that is essential for the normal functioning of human beings. However, it is also true that deterioration of functioning can be produced by very high levels of stimulation. Perhaps, then, it is best to conceptualize an *optimal* level of stimulation. It is likely, also, that there may be wide individual differences in terms of just what that optimal level is. Perhaps a level of stimulation that is acceptable for one person would be completely intolerable for another.

One psychologist, D. E. Berlyne (1965) has distinguished between *perceptual curiosity* (e.g., visual curiosity) and *epistemic curiosity*. Epistemic curiosity may



Studies of the effects of sensory deprivation have been carried out by the United States Air Force using rooms like this one. The subject lies in darkness and complete silence, with arm-length cuffs to minimize tactile stimulation.

be thought of as the desire for knowledge, the desire to obtain additional information, and is produced, according to Berlyne, by *cognitive conflict*. Cognitive conflict is an internal state that exists whenever one has incomplete or contradictory information or concepts. For example, suppose that a teacher looks up the IQ score of one of her favorite pupils, Mary, and finds that it is 68, a very low IQ. Yet Mary has been doing very well in class, whereas children with IQ's as low as 68 seldom do well academically. This kind of incompatible information is difficult to live with. Presumably, it produces a state of cognitive conflict which motivates the teacher to seek additional information. The teacher may find that Mary's IQ score was calculated or recorded incorrectly, and that it should have been 108. Now the conflict has been reduced, and such reduction reinforces the teacher's exploratory or information-seeking behavior. Berlyne has emphasized the value of establishing cognitive conflict in the student as a basis for motivation for inquiry. The reader might consider the relation between Berlyne's theory and the "discovery method" of teaching discussed in the text.

These are some of the main lines of evidence related to curiosity and exploratory behavior. Initially, most psychologists attempted to explain these phenomena on the basis of learning or on the basis of some other primary drive. Recently, however, there is growing agreement that much (though certainly not all) of this sort of exploratory and manipulative behavior is based on particular "built-in" features of the nervous system and indicates a type of primary motivation quite different from others that we have considered.

Motivation based on learning

Many events that reinforce human behavior seem to have no direct link to physiologically based drives. These have been termed *secondary reinforcers*, since their reinforcing properties probably derive from learning, i.e., from prior association with primary reinforcement. *Social approval* is one of the most powerful forms of reinforcement for most human beings. We know also that the effectiveness of social approval depends in part on who is dispensing the approval, and that this varies with age and with certain other factors. Approval by parents constitutes powerful reinforcement for the young child, whereas approval by peers and others is a relatively unimportant source of reinforcement. During the early school years, peer approval and teacher approval become powerful forms of reinforcement.

In instances where parental approval is contingent on one type of behavior (e.g., coming home early) and peer approval on another (e.g., staying with the gang), conflict may arise. Many psychologists believe that the motivating properties of social approval are rooted in the warmth and nurturance provided by the parents during infancy. According to this view, an infant who receives minimal nurturance is less likely to be motivated by a desire for the approval of others. This may lead to a disregard for the standards of society and to criminal behavior.

Achievement motivation has received considerable attention from psychologists in recent years. The basic question here is what motivates human beings to achieve and to master their environments. We have seen that an unlearned curiosity or exploratory drive may be involved. However, learning also seems to be important, since psychologists have discovered a relationship between certain patterns of childrearing and the degree to which individuals strive for achievement. Evidently parental behavior that combines warmth with encouragement of independence is most likely to lead to high achievement motivation.

The way in which *fear* or *anxiety* may be learned and the motivational properties of anxiety have been discussed previously. Many psychologists believe that anxiety is the chief source of motivation for a great deal of social behavior, and that anxiety reduction provides the reinforcement. Consider the following reasoning. In childhood, punishment generally is accompanied by other signs of disapproval. Fear or anxiety becomes attached to these signs through classical conditioning. Later, when we detect a sign of disapproval from someone who is important to us, anxiety is aroused, and we are motivated to reduce the anxiety. How can we reduce it? By behaving in a way that will gain the approval rather than the disapproval of the other person. A persuasive argument can be made for the application of this reasoning to a wide variety of human behavior. However, some suggest that only an anxiety-ridden psychologist would go that far.

Frustration and conflict

The term frustration is used to refer to an aversive or unpleasant emotional state that results from failure to attain a desired and expected goal. Since frustration is an aversive condition, the organism is motivated to reduce it. We would expect, then, that any behavior that results in the reduction of frustration will be reinforced.

In general, the more desirable the goal, the greater will be the frustration when the goal is not attained. However, simply because we would like something to occur does not mean that we necessarily will be frustrated when it does not occur. For example, most of us would like a salary increase of \$5000 a year, but few of us are frustrated when it is not forthcoming. This is because we did not anticipate such an increase. Thus, degree of expectancy is an important determinant of degree of frustration. This is illustrated by studies in which the pathway to a goal box in which a rat previously found food now is blocked. The closer the animal is to the goal when blocking occurs, the greater is the frustration. Presumably this is because expectancy of reward increases as the rat approaches the goal box. Similar results have been found with human subjects.

Among the most common behavioral outcomes of frustration is aggression. This is particularly apparent in young children when they are denied their favorite toy or candy. However, frustration does not always result in aggression, even in young children. There is considerable variability in the reactions of people to frustration. Some are very persistent, some become very angry and aggressive, and others simply withdraw passively. The typical response will vary from person to person, depending largely on the person's particular background. A child who is successful in overcoming obstacles by bullying or flying into a rage will learn this kind of behavior in response to frustration. Some parents will not allow this kind of behavior to pay off, so that the child learns to respond in some other way to frustration.

From a mental health viewpoint, there are two factors concerning frustration that should be emphasized. One is that individuals whose expectations for themselves are consistently unrealistically high will be facing continuous frustration. Thus it is important to set goals for ourselves and our children that at least seem possible of achievement. Second, since we all face frustration frequently even when our goals seem realistic, it is important that we acquire patterns of response to frustration that are useful rather than debilitating. For example, temper tantrums may work for the two- or four-year-old at home, but as the child moves into the broader social world this approach is likely to lead to social rejection and thus to even greater frustration and unhappiness.

It is interesting to apply some of these principles to current social problems. Some observers have found it difficult to understand why demonstrations and riots by Negroes are more prevalent in Northern cities than in the Deep South where conditions for Negroes generally are worse. Two factors probably account for much of this difference. One is that fear of violent retaliation from the white community probably is less in the North. Second, and more relevant to our present discussion, is that the expectancy of social equality is greater in the North, and thus frustration is greater when this goal is not attained.

In our daily life, a number of motives operate simultaneously. Quite frequently two (or more) of these motives come into *conflict*. That is, the motives lead us

toward responses that are not compatible with one another. Often one motive is stronger than the others and our course of action is fairly clear, i.e., conflict is not great. However, when these incompatible response tendencies are both high and nearly equal in strength, conflict is great, producing an internal emotional condition that is extremely unpleasant and sometimes debilitating. As with frustration, our past experiences are major determinants of the approaches we generally take toward resolving conflicts. In fact, some psychologists consider conflict to be a particular form of frustration.

Psychologists generally distinguish among four types of conflict-producing situations. *Approach-approach* conflicts are those in which the individual is confronted with two incompatible alternatives, both of which are desirable. For example, shall I order steak or lobster? Most such conflicts are relatively easy to resolve and do not have serious consequences. *Approach-avoidance* conflict exists when something or someone is both attractive and repulsive to the individual. Such conflicts may become quite serious and difficult to resolve. For example, most young unmarried people on occasion are strongly motivated to engage in sexual intercourse. At the same time, they may feel guilty about their desires and fearful of the consequences of intercourse. The result may be a great deal of emotional turmoil. The individual can neither resolve nor forget the problem, but vacillates between "going all the way" and terminating the relationship entirely. Often a compromise is worked out. In this case, for example, the individual may settle for extended sex play short of intercourse, thus achieving some degree of satisfaction at a minimum cost in terms of anxiety and guilt. Sometimes, however, a satisfactory resolution of the conflict is not achieved, and the individual's general effectiveness is reduced. It is just this sort of situation that leads many persons to seek some form of personal counseling or psychotherapy.

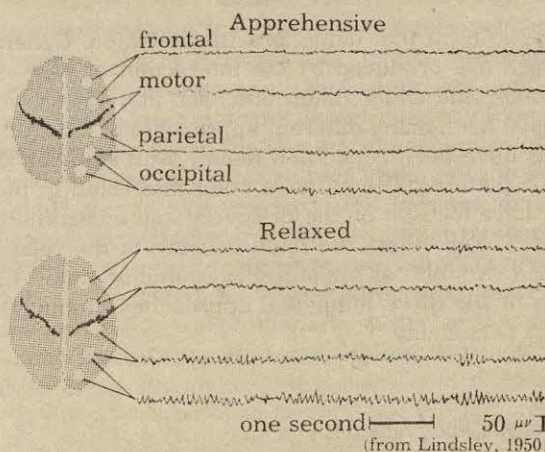
A third type of conflict is *avoidance-avoidance* conflict, where the individual is faced with two or more undesirable courses of action. A very topical illustration is the situation in which a young man is faced with having either to enter the armed forces or go to prison, both of which he finds strongly objectionable. Prolonged indecision is common in such cases, and the emotional and physical consequences to the individual may be serious. Efforts to withdraw or escape the entire situation, either physically or psychologically, often are observed.

Finally, the case in which two alternatives exist, each of which has both approach and avoidance tendencies, is termed a *double approach-avoidance* conflict. Such situations are common and may be difficult to resolve. Consider the individual choosing between an excellent job in a very undesirable area and an unattractive job in an ideal location.

Brain functions, arousal, and reinforcement

One dimension of behavior is the degree to which the organism is *aroused* or *activated*. Recently there has been a great deal of research devoted to understanding the physiological processes, particularly those involving the central nervous system (CNS), that underlie this dimension. Only a few comments will be made concerning this research, since any more detailed treatment would require a much more complete description of the nervous system than is possible here.

Electrical activity in the brain can be measured in some degree by attaching electrodes to the skull. A record of such activity, called an *electroencephalogram* or *EEG*, shows that during deep sleep the level of electrical activity is low. Skeletal muscles are relaxed, and those mechanisms which enable the individual to mobilize his resources in times of stress are inactive. As an individual awakens, electrical activity in the brain increases, the glandular secretion of energizing hormones increases, and skeletal muscles become more tense. As arousal increases, the individual becomes more responsive to external stimulation, and the proficiency of his performance on a wide variety of tasks is increased. However, this is true only up to a point. Under conditions of extremely high arousal, such as exist when strong emotions are present, performance deteriorates. Thus we can think of an optimal level of arousal, below which and above which the organism becomes less effective in dealing with his environment. For example, under conditions of mild anxiety the individual is likely to be quite effective. When fear becomes intense, though, effectiveness drops off sharply. In fact, intense fear sometimes produces complete immobility.



Electrodes placed on the subject's scalp relay to a moving paper the electrical activity of the four areas on each side of the brain. The eight currents are thus recorded in parallel form. Shown here are EEG records (for one side of the brain) taken when the subject was apprehensive and again when the subject was relaxed.

Degree of arousal and of emotional experience have been linked to certain portions of the brain and of the brain stem (located just below the brain). Direct electrical stimulation of certain areas produces immediate arousal. Destruction of certain areas results in the elimination of emotional responses. There appears to be a complex system of neural, glandular, and muscular activity that energizes and sustains behavior related to environmental events.

In a fascinating series of experiments, it was shown that an electrical stimulation of certain areas of the lower portions of a rat's brain functions as positive reinforcement (Olds and Milner, 1954). These studies made use of a Skinner box designed in such a way that whenever a rat pressed the bar he received a shock

through an electrode surgically embedded in his brain. Under these conditions rats made as many as five thousand bar presses per hour. The brain area involved is highly specific; if the electrode is implanted just slightly to one side or the other this effect is not produced. Negative reinforcing centers also have been found (Miller, 1957). When such centers are stimulated electrically, an animal reacts with fear and attempts to escape the stimulation. Similar electrophysiological techniques have been used to identify and study areas of the brain involved in such drive-related behaviors as eating, drinking, and sexual activity.

Section 7

PERSONALITY

Personality is a vague term that defies precise definition. Generally, it refers to those qualities which are produced by the interaction of past experiences with genetic characteristics, and which determine each individual's unique pattern of behavior. There have been many different approaches to the study of personality. Some psychologists have been concerned mainly with studying the *determinants* of various behavior patterns. Others have been interested in the *consistency* of personality. Some have focused on the discovery and measurement of personality—personality *traits*. For others the main concern is the relationship between personality and such variables as sex and socioeconomic status. In this section we shall discuss some of the more influential approaches, findings, and theoretical concepts relative to personality.

Freud and psychoanalytic interpretations

By far the most influential individual personality theorist was Sigmund Freud. Based largely on his experiences (as a physician and therapist) with emotionally disturbed patients, Freud offered both a general theory of personality and an approach to treatment (psychanalysis). We shall consider some of the most influential of Freud's ideas without an attempt to cover the full complexities of psychoanalytic theory. Less attention will be given to psychoanalysis as a treatment approach.

Determinism and unconscious motivation Freud observed that his patients frequently could offer no plausible explanation for their behavior, often insisting that there was no motive at all for it. This was unacceptable to Freud, since he was convinced that all behavior is motivated, or caused, a notion that was not fully accepted at that time (the late 1800's). He also became convinced that, at least in

most cases, his patients were not lying to him, but that they simply were not aware of the motivation for their behavior. That is, Freud concluded that motives frequently are unconscious and can be uncovered only by diligent application of certain psychoanalytic techniques (e.g., free association, analysis of dream content). Both the notions of *psychological determinism* and *unconscious motivation* are widely accepted today (at least by psychologists), and constituted a significant step toward greater understanding of human behavior.

Conflict, anxiety, and repression Freud found that the process of uncovering unconscious motives produced a great deal of anxiety in his patients. His observations led him to conclude that desires and actions that are in strong conflict with what we have learned to believe is right produce *anxiety*, and the more unacceptable our desires or behavior, the greater the anxiety. Thus, whenever we recall our unacceptable behavior or wish, we feel anxious and guilty. These are aversive conditions that we wish to avoid. Freud postulated that the most basic mechanism of defense against anxiety is *repression*, a mechanism by which unacceptable memories are relegated to the unconscious. Consider the following example. After being spanked for some misdeed, a little girl says, "Go away mother. I don't like you." An hour later the mother is killed in an automobile accident while the girl is home with a babysitter. Daddy explains that "Mama has gone away on a long trip." Later the girl learns the truth and is overcome with guilt, thinking that she, by her angry words, caused her mother's death. The very thought of these events is extremely anxiety-producing, so the automatic mechanism of repression comes to her defense, and now she is unable to recall many of the events surrounding her mother's death. However, repressed material does not simply lie in the unconscious forever. Events occur that remind the girl of her mother and her mother's death, and some of the repressed material pushes into consciousness, resulting in extreme anxiety. Freud believed that during sleep the barriers between the unconscious and the conscious are particularly weak, so that repressed material enters the content of the dreams. However, it does so in a disguised fashion, so that skillful analysis of the dream content is necessary to uncover the repressed material.

Sexuality and early experiences Freud was struck by the frequency with which repressed sexual desires seemed to be involved in neuroses. He became convinced that the anxiety that characterizes neurotic individuals is most often produced by the memory of sexual desires or behavior that are in conflict with the individual's standards of morality. Moreover, it seemed to Freud that most such anxiety had its origins in childhood, often very early childhood. Up to that time, most people preferred to think that the sex drive and sexual behavior did not emerge until adolescence. Freud pointed out that this simply was not true, and that evidence of sexuality can be observed even in infancy. This perhaps was (and is) the single most controversial aspect of Freudian theory—its tremendous emphasis on sexuality.

Today few personality theorists place sex in as central a position as did Freud, although all are now aware that sexual motivation is one important determinant of our behavior and that sex is often involved in anxiety-producing internal conflict. However, we are indebted to Freud for the insight and courage that

he displayed in bringing such matters into the open in the face of bitter opposition and denunciation by a middle-class Victorian society and by many of his fellow professionals.

Freud's stress on the importance of early experience also was a valuable step forward. Most psychologists accept his conclusions that personality development begins in infancy and that many of the behavior patterns of the adult are determined largely by childhood experiences. There is much less agreement as to just *how* this comes about.

Concluding comments No mention has been made here of such concepts as *id*, *ego*, *superego*, *libido*, and *psychosexual development*. All these and a few more are briefly described in your text (Chapter 3). That material, along with the last few pages, should give the reader some feel for psychoanalytic theory. Still, it is a very incomplete description and hardly a significant basis for the student to fully evaluate Freud's contributions. Perhaps a few remarks on the place of Freudian views in modern psychology will be helpful.

There is little question now that Freud was correct in many respects, as has been pointed out earlier. Understandably, he also was incorrect in many respects, particularly in certain details of his theory relative to psychosexual development. This is to be expected. No theory stands forever. A more serious criticism is that many aspects of psychoanalytic theory are stated in such a vague, ambiguous fashion that their *scientific* utility is virtually nil. Recall that to be useful, a hypothesis must be empirically testable. This is not true of much of psychoanalytic theory. This does not mean that the ideas are worthless, but it does mean that their usefulness, both theoretical and practical, is severely limited.

Unfortunately, there seems to be a tendency for people to oversimplify and become quite emotional about psychoanalytic theory. Some act as though Freud were a modern day Moses; others call him a charlatan. In fact, Freud was a dedicated pioneer who contributed important insights regarding human behavior. And, like any pioneer, he opened new territory that others will develop.

Learning and personality

Nearly all psychologists agree with Freud that early experiences play a critical role in personality development. Since these experiences involve learning, it is reasonable to ask how well basic learning principles can account for the effects. From a learning point of view, we can conceive of personality as a set of motives and habits, most of which are primarily determined, or at least strongly influenced, by past learning. Most of the relevant learning principles already have been described in our discussion of conditioning in Section 4.

Classical conditioning has been demonstrated with infants only a few weeks old. Two examples of early learning through classical conditioning involve the feeding situation. In one study (Lipsitt and Kaye, 1963) with three-week-old infants, the sucking response was conditioned to a tone. This was done by pairing the tone (the CS) with insertion of a nipple (the UCS) into the infant's mouth. Another instance that appears to exemplify aversive classical conditioning was reported by Gunther (1961), a physician who had observed a large number of mothers attempt-

ing to breast-feed their newborn infants. Gunther reported that some mothers held their infants in such a way that their nasal passages were blocked, cutting off their oxygen supply. When this occurred the infant typically pulled away from the breast, often crying. If this occurred several times in succession, crying and pulling away from the mother occurred even before the infant was put to the breast. Gunther reported that a common result in such cases was that the mother became upset and unsure of herself in dealing with the baby. That is, this simple little event would lead her to behave somewhat differently toward the baby than she otherwise would have. It is easy to imagine that in some cases a sort of chain reaction would be set off that might have far-reaching effects.

Operant or instrumental learning by infants also has been reported. For example, in one study (Brackbill, 1958) the frequency of smiling in four-month-old infants was increased through operant conditioning. In this case, the reinforcement consisted of smiling back at the infant and cuddling him.

The desire to obtain the approval of others seems to be a dominant motive for some people, and much less effective for others. Some individuals are habitually neat and orderly, others much less so. What are the particular kinds of learning experiences that are involved in producing these and other personality differences? Two well-known psychologists (Dollard and Miller, 1950) have suggested that situations involving *feeding*, *cleanliness*, *sex*, and *aggression* provide some of the most important early learning experiences relevant to personality formation. These are particularly critical because they recur frequently, they require a high degree of interaction between parent and child, they involve strong drives, and there frequently are conflicts and frustration in connection with them.

Feeding Consider what generally happens when a hungry infant is fed. The ingestion of food reduces the hunger drive, which, as all parents know, is very strong and frequently aroused early in infancy. Also, when the infant is held during feeding, the resulting physical contact is a source of pleasure. Studies with monkeys suggest that this *contact comfort* is an extremely important element in the mother-infant relationship. Finally, feeding often means removing the infant from a situation involving little stimulus variation (e.g., lying in a crib) and putting him in a situation involving increased auditory and visual stimulation. We have seen earlier that individuals are motivated to seek some degree of stimulus variation. We would expect, then, that in most cases feeding would be an extremely *satisfying* experience to the infant. Since this experience is repeated literally hundreds of times within the first few months of birth, there is ample opportunity for these feelings of contentment and satisfaction to become conditioned to the stimuli or *cues* that are present during feeding.

What are these cues? Of course they may vary somewhat from infant to infant, but they nearly always include the mother's voice and appearance. Thus, in most cases, we would expect that the mother herself would come to elicit feelings of contentment and satisfaction. Moreover, through stimulus generalization, similar feelings would be elicited by other human beings (e.g., the father, friends, etc.). One might speculate, then, that early experiences such as these form the basis for later dependency and for a general positive feeling toward people.

Of course, these early experiences are not always so happy. If an infant's mother is cold and rough with him or if she neglects him severely, the learning

that occurs is quite different. This also may be true for infants raised in orphanages or other institutions where the quality and quantity of care is very poor. Fortunately, such institutional inadequacies are not so common as they once were.

Cleanliness training The most important aspect of cleanliness training in our culture is toilet training and particularly the punishment that often is doled out for the child's failures in this regard. We already have seen that emotional responses (e.g., anxiety) can become attached to whatever cues are consistently present when these responses are produced. If punishment is frequent and severe, the mother (or father) may become a fear-eliciting cue, and the degree of fear may be quite high. The anxiety may also become "attached" to the particular feelings associated with having to defecate or urinate. That is, the child may learn to avoid punishment by "holding back." This is thought to be one cause of constipation. Other cues to which the anxiety may become conditioned are the organs of elimination, since these are so directly involved in the acts that lead to punishment. Some psychologists believe that anxiety about sex often originates in severe toilet-training practices, noting that the sex organs are also involved in the wetting of pants that results in punishment.

Sex training Masturbation, examination of the genitals of others, and other forms of sex play are common among children. In our culture, however, these behaviors, when discovered by parents, often lead to severe punishment. The punishment may not be physical. Instead, the parents may stress how "bad" and "dirty" and "nasty" these activities are. Sometimes they go much farther, and warn the child that such behavior may result in physical or mental abnormalities. It is not difficult to see that children treated in such a fashion might develop tremendous and debilitating fears regarding sex.

Aggression For many parents the aggressive behavior of their children is a recurring problem. Typically, parents wish their children to assert and defend themselves but not to be the aggressor. The difficulty in learning such a discrimination can be great. Consider how unsuccessful adults are in this respect, particularly with regard to international affairs. Often the task is made even more difficult by certain inconsistencies that exist within the family. One of these is the case in which the parents preach nonaggression but practice aggression. Another is the case of disagreement between parents. For example, the mother abhors and discourages physical aggression by her son while the father admires and encourages it. Such situations are likely to result in internal conflict and anxiety.

Societal expectancies regarding aggression are quite different for boys than for girls. Consider the advice a parent might give a child who has been hit by the neighborhood bully. A boy is likely to be told to hit back, to stand up and defend himself. A girl is more likely to be advised to come home and tell her parents or to avoid the "nasty bully."

A few generalizations can be made regarding learning and aggression. First, if aggressive behavior consistently results in reinforcement and is not punished, it is likely to increase in frequency. For example, consider a large, strong boy whose aggression toward other children consistently gets him what he wants. In addition, his parents are "permissive" regarding his aggressive behavior. Such a child is likely to become an aggressive individual. However, there is evidence that physi-

cal punishment for aggression also can result in increased rather than decreased aggressive tendencies, even though the aggressive behavior is not reinforced in the usual sense. One reason here is that by using physical punishment, the parents provide the child with a *model* of physical aggression which he is likely to imitate. Such a child may suppress his aggressive tendencies around home but be a "holy terror" in school and elsewhere.

Probably the family situation that is most likely to result in a low level of aggressive behavior is one in which (a) the parents themselves do not display aggression, and (b) the child's aggression consistently results in disapproval but not in physical punishment.

Concluding comments In the above paragraphs we have examined briefly four types of learning situations thought to be particularly significant in the development of basic personality qualities such as dependency, aggression, and anxiety about sex. Of course, these are not the only important learning situations. Interactions with siblings and peers also influence the course of personality development. Moreover, the results of such experiences will vary from person to person, depending upon particular genetic characteristics. Thus, it is always difficult and often impossible to give good advice regarding specific child-rearing practices in individual instances.

Much of the advice given parents has been based on theoretical speculation rather than on scientifically acceptable evidence. For example, some writers, particularly those influenced by psychoanalytic theory, have stated that breast feeding and relatively late weaning lead to more healthy personality development than do bottle feeding and early weaning. The best evidence simply does not support this conclusion. In fact, there is so much interaction among variables that few generalizations about single specific practices are possible.

Personality development—the stability of behavior

Will an extremely aggressive four-year-old remain highly aggressive throughout his life? Will the highly dependent five-year-old behave similarly as an adult? Such questions are equally important to parents and to psychologists. Fortunately, considerable information regarding the stability of behavior patterns is contained in the results of a major study reported just a few years ago (Kagan and Moss, 1962). In that study, conducted at the Fels Research Institute, the behavior of 71 individuals was observed repeatedly from their birth until they were in their twenties.

For behavior patterns related to *dependency*, *aggression*, and *achievement striving*, substantial stability did not emerge until the school years. The authors' interpretation of these results is of interest:

As with dependency and aggression, achievement behavior during age 6 to 10 was a moderately reliable predictor of future behavioral predispositions. Prior to school entrance, the establishment of stable goal-related responses in these areas is still in flux, and some of the critical situations and experiences that crystallize adult motivational dispositions either have not occurred or have not had sufficient time to exert their effect on the child's behavior.

The first four to five years of school appear to be a critical period for the child. He is forced to resolve some of his dependent ties to his family, to learn academic skills, and to work out relations with peers. Moreover, he is exposed to the values and attitudes of new social agents (i.e., teachers and peers) who either support existing goals and values or create conflict in the child. As preadolescence approaches, many children have formulated stable behavioral strategies in the areas of passivity, aggression, and intellectual mastery. This is a time when one can obtain a moderately accurate preview of what the young adult might be like. (Kagan and Moss, 1962, p. 154)

It appears, then, that we would be in error to assume that personality is fully formed and unmodifiable by six or even ten years of age. On the other hand, some of the personality characteristics that underlie certain aspects of adult behavior evidently often develop much earlier than six years of age. For example, in the case of boys (but not girls) there was found to be a substantial relationship between degree of *passivity* at age three and *dependency* and *nonmasculinity of interests* during childhood. Passivity was defined in terms of the tendency to withdraw when frustrated or attacked.

A number of interesting differences between males and females in behavior consistency were found. Dependency was a more stable pattern of behavior for girls than for boys, while aggression was more stable for boys. The authors interpreted many such differences in terms of the concept of *sex-role identification*. Certain types of behavior are generally considered more appropriate for one sex than for the other. Men are expected to be more aggressive, women more dependent. As the child grows, he or she begins to identify with a particular sex role, and to adopt forms of behavior more consistent with that role. For example, most parents are tolerant of doll play by their son when he is two, but not when he is six. Similarly, an eight-year-old girl with strongly masculine interests is laughingly called a tomboy, but if this pattern continues, parental concern and pressure are likely to increase sharply.

Research such as this provides much-needed information relative to personality development. Unfortunately, few such studies have been conducted, largely because of the tremendous expense and amount of time necessary to follow closely a large number of subjects over such a long period of time.

The self

For many psychologists, the notion of *self-concept* is central to the understanding of personality. In the same way that the child acquires concepts regarding various aspects of his environment, he acquires a concept of himself. An extremely important aspect or dimension of the self-concept is *self-esteem*, the degree to which one conceives of himself as worthy or unworthy, good or bad.

The initial development of self-concept is determined largely by interaction with parents. If a child's parents consistently point out how "bad" he is, the child tends to see himself as "bad." For each of us there is some degree of discrepancy between our self as we believe we *are* and our self as we believe we *ought* to be. When that discrepancy is very great, a high degree of guilt and anxiety is present,

and the individual is said to be neurotic. Notice that this view is similar to psychoanalytic and learning interpretations in its emphasis on anxiety as the basis for neurotic disturbances.

It is important to understand that one's self-concept can be and often is quite different from the concept others may have of him. For example, we are likely to see as highly successful a man who has a high-paying, prestigious position, a beautiful wife, handsome children, and many friends. When we learn that such a person has left his job and family, or that he has attempted suicide, we are shocked. It is difficult for us to understand that in the person's own mind, he is a dismal failure. It is the individual's concept of himself, together with his particular perception of his environment, that is the primary determinant of his behavior. This idea is discussed at length in your text, thus we shall consider it no further here.

Personality assessment

The task of measuring personality characteristics or traits is an extremely difficult one. We shall consider briefly some of the more common approaches to personality assessment.

Direct observation of behavior Perhaps the most straightforward approach to assessing personality is to observe an individual's behavior and then make judgments regarding personality characteristics on the basis of these observations. This approach was used to a great extent in the Fels Research Institute study of personality development that was reported earlier. When properly done, this is a very effective approach. However, there are a number of disadvantages that should be considered. It takes a great deal of time and money to collect sufficient observational data. Once data are collected, the process of making judgments is troublesome. A common technique is to specify in advance a number of different "types" of behavior, then to assign each individual a *rating* on each type of behavior on the basis of the observational data. This generally is a highly subjective matter in which biases or expectations of the rater can play a major role. Thus, it is desirable to have more than one rater work independently, then to compare ratings to determine the amount of agreement. These and certain other pitfalls make this approach impractical in many instances, although it can be, as in the Fels study, a source of extremely valuable data.

Personality inventories A second common approach is the use of carefully developed questionnaires called *personality inventories*. Inferences regarding personality traits are made on the basis of the subject's responses to such questions as: "Do you worry a lot about what others think of you?" or "Do you feel self-conscious about meeting people for the first time?" Naturally it is necessary to include a number of different questions relating to each trait that is being measured. Personality inventories have the advantage of being easily and quickly administered and objectively scorable. They also have some fairly serious limitations. One problem concerns "fakability"—the fact that it is often possible for a subject to "see through" the questions and choose the responses he thinks are most favorable, giving a grossly inaccurate picture of his "true" personality. Some personality inventories include questions that are designed specifically to reveal

this dishonesty. Perhaps the most successful in this respect is the well-known Minnesota Multiphasic Personality Inventory or MMPI (Hathaway and McKinley, 1943). The MMPI consists of 550 statements each of which must be categorized as "True," "False," or "Cannot Say." Typical statements include "I tire easily," and "One should never trust even his friends too much." The statements are organized into nine subjects, each designed to represent one dimension of personality. As is true of several other personality inventories, the MMPI was developed to identify persons suffering from relatively severe emotional disturbance, and its greatest usefulness is for that purpose.

Projective techniques Projective techniques are most often used to gain a general picture of an individual's personality organization. There are many such devices but all share one basic assumption, namely, that if a person is asked to respond to complex ambiguous stimuli, he will reveal aspects of his personality in the responses he makes.

The best-known projective device is the Rorschach Test, which consists of a number of inkblots. The subject is shown the inkblots and asked to describe what he sees. (The photograph on page 439 shows a psychologist administering this test.) The subject presumably will "project" himself into his interpretation of such ambiguous stimuli.

Another frequently used projective device is the Thematic Apperception Test or TAT. This consists of a set of ambiguous pictures. The subject is asked to tell a story about the situation depicted in each picture. These stories are then studied to determine what themes underlie them, etc.

There are a number of other widely-used projective techniques that we are unable to describe here. In each case ambiguous stimuli are presented to the subject and his responses are interpreted by the psychologist.

One important advantage to these techniques is their resistance to faking. A striking problem with their use results from the subjectivity involved in scoring and interpreting the results. In fact, studies have shown that when two psychologists score and interpret the same set of responses, substantial disagreement between them is quite likely. It would be unwise to draw conclusions regarding personality structure from a single set of responses to a projective device. However, when used cautiously in conjunction with other techniques, projective tests can be of value to the clinical psychologist or the psychiatrist.

Section 8

SOCIAL PSYCHOLOGY

The focus of social psychology is mainly on interactions among individuals and among groups. In both objectives and methods, it is closely allied to anthropology and sociology, as well as to other areas of specialization within psychology. Much of the research of social psychologists has widespread popular appeal, largely

because it so often deals with problems that are of constant concern to all—problems related to such concepts as social structure, social attitudes, prejudice, cooperation, competition, persuasion, leadership, decision making, communication, and conformity. A few of these important areas of research will be considered in this section.

Socialization and society

The term *socialization* refers to the ways in which an individual's behavior is influenced toward conformity with the general behavior patterns found within his social environment. Since these general behavior patterns vary somewhat from society to society as well as within a particular society, the course of socialization also varies. For example, in some primitive societies aggression and competition are nearly absent, while in others these behaviors are dominant. Yet although the results differ, the processes underlying socialization are similar. Children in one society typically become noncompetitive largely because noncompetitive behavior is reinforced by social approval and competitive behavior is nonreinforced or even punished. In a society such as ours, frequent reinforcement of competitive behavior by both social approval and more tangible rewards results in a fairly high level of competitive behavior.

These elements of society that are particularly influential in the socialization process often are called *socialization agents*. For the infant and young child in our society, the primary agents of socialization are family members, particularly the mother. In some societies the family continues as the dominant socialization agent throughout childhood and adolescence. In our urban society, particularly in recent years, the peer group, the schools, church groups, etc., have become increasingly important in the socialization process. The forces that are producing these changes and the ways that the various socialization agents function to influence the individual are the concern of many sociologists and social psychologists.

Differences within society

Research has shown that certain kinds of behavior are related to such variables as religion, race, education, income, general geographic location, population density of the community, and political views. Until recently, a vast majority of Southerners and of low-income persons regardless of location voted Democratic. Divorce rate is related to religious background, with Jews having a lower rate of divorce than Protestants. Birth rate is higher for Catholics than non-Catholics, for low-income than high-income families, and for Democrats than Republicans. A great many relationships such as these have been discovered. It is important to note that however interesting such relationships may be, they do not tell us much about what *causes* what. For example, the fact that Democrats have larger families than do Republicans does not mean that being a Democrat *causes* one to have more children. This point was discussed in Section 1. A second important point is that we are talking about group *averages*. Certainly many Jews are divorced, many Catholics have small families, and many low-income persons vote for Republican candidates. Thus we must take care not to overgeneralize about group traits.

Sociologists often describe individuals in terms of *social class*, which is most often defined in terms of amount of income, source of income, and educational background. These *socioeconomic factors*, taken together, determine to which of several classes one is assigned. One of the most common classification schemes (Warner, Meeker, and Eells, 1949) consists of six levels: *upper-upper*, *lower-upper*, *upper-middle*, *lower-middle*, *upper-lower*, and *lower-lower*. Recently we have seen a growing concern with members of the lower-lower class. In urban areas most of these families are slum-dwellers, often with fathers either absent or unemployed. In rural areas, migrant farm workers make up a large proportion of the lower-lower class.

Probably close to 25 per cent of school-age children are members of lower-lower-class families. A relatively high proportion of school dropouts, juvenile delinquents, and chronically unemployed persons are of lower-lower-class background. However, as your text emphasizes, it is easy to overgeneralize here too. Many such children are academically successful and become highly productive citizens.

Nevertheless, social-class membership is related to certain important patterns of behavior. For example, class differences in sexual behavior have been found. Premarital intercourse by adolescents is much more frequent among the lower classes while other forms of sexual behavior (prolonged petting and masturbation) are more frequent among the middle classes. Lower-class parents generally apply greater pressure toward conformity to traditional sex-typed behavior. That is, their concepts of what is appropriate for boys and what for girls are more rigid and more rigorously enforced. One result of this is that sharp sex differences in interests and play activities appear earlier among lower-class children. Again it must be stressed that these are average differences and many exceptions exist. Also, there seems to have been a decrease in these differences in recent years.

Aspects of group behavior

Communication within groups Groups vary in terms of freedom of members to communicate among themselves. In some groups all are free to communicate with each other. At the other extreme are groups whose members can communicate only with one central person. Between these extremes are varying degrees to which communication is restricted. Social psychologists have studied the relative effectiveness of various communication networks among group members engaged in some common task. Most investigators have found that group morale and motivation decrease as communication restrictions increase. Performance varies too: when the task is very simple, there is little difference in performance among the various networks; however, when complex problems are involved, nonrestricted groups are superior (Shaw, 1954).

Evidently when communication channels are unrestricted, each group member feels that he is privy to the same information, and has as much chance to influence group decisions as anyone else. When direct communication is possible only with one or two others, the individual is not sure that he is being kept fully informed, nor does he feel that he has as much chance to influence those members with whom he can communicate only through a "middle man."

FIGURE 2: DISPLAYING SCORES MEANINGFULLY
 Ways of ordering reading comprehension scores obtained
 on the California Achievement Test

Raw data	Ordered data	Frequency distribution		Grouped frequency distribution		
X	X	X	f	class interval	X	f
63	78	78	1	78-80	79	1
62	77	77	1	75-77	76	1
47	74	76	0	72-74	73	2
62	74	75	0	69-71	70	3
61	71	74	2	66-68	67	3
62	70	73	0	63-65	64	7
62	70	72	0	60-62	61	13
62	67	71	1	57-59	58	4
59	66	70	2	54-56	55	3
62	66	69	0	51-53	52	1
65	65	68	0	48-50	49	1
59	65	67	1	45-47	46	1
77	65	66	2			
60	65	65	4			
65	64	64	2			
78	64	63	1			
70	63	62	9			
62	62	61	2			
62	62	60	2			
59	62	59	4			
59	62	58	0			
71	62	57	0			
70	62	56	0			
61	62	55	2			
55	62	54	1			
66	62	53	0			
67	61	52	1			
65	61	51	0			
55	60	50	1			
62	60	49	0			
54	59	48	0			
74	59	47	1			
66	59					
74	59					
52	55					
64	55					
50	54					
64	52					
60	50					
65	47					

when:
 X = value of raw score
 f = frequency of occurrence

Group decisions and risk In many decisions considerable risk is involved. For example, should I leave my secure position for one that pays better but offers less security? Or, consider decisions at the international level, such as that made by the late John F. Kennedy regarding the confrontation with the U.S.S.R. over their shipment of missiles to Cuba. Do groups differ from individuals in their willingness to take risks?

Research on this important question seems to have provided a fairly clear-cut answer. In one recent study (Kogan and Wallach, 1967), college students met in groups of five to reach decisions wherein one of the two possible alternatives offered a possibility of high gain but also was more risky (i.e., the odds for high loss also were greater). In some groups the problems were discussed before decisions were reached and in some they were not. Some groups were forced to reach a consensus while others were not. The major finding was that discussion of the situation led to riskier solutions than were given when no discussion had occurred. It appears that discussion has the effect of distributing the responsibility for the consequences of risky behavior over a greater number of individuals. That is, an individual would feel less personally responsible for any disastrous outcomes of the decision.

Conformity The expressed opinions and attitudes of individuals are strongly influenced by the opinions and attitudes of others. Opinions given in private tend to be more variable than those expressed in a group situation. That is, the effect of the group is to eliminate expression of opinions that deviate greatly from those held by most group members. A more complete consideration of the topic of conformity is found in Chapter 9 of the text.

Prejudice

A topic of particular concern these days is *prejudice*. Two factors appear to be important in determining the degree to which an individual displays prejudice and the nature of the prejudice displayed. One is the individual's particular personality, and the second is his group membership.

Some research has suggested that people with strong prejudices tend to be highly authoritarian and hostile in general. They tend to be rigid in their conformity to the rules that they accept and in their insistence on the conformity of others to these same rules. They are extremely loyal to their own social group and intolerant of views and behavior different from their own. Such individuals frequently are products of highly authoritarian homes, and lacked a close warm relationship with their parents. However, it would be wrong to conclude that all prejudice is a reflection of these personality characteristics. One's social environment also is important in this respect. A good example of this is the prejudice of South African whites against the native Negroes, which exists even among those whites who are not particularly authoritarian in personality structure.

To a considerable degree prejudice is learned just as other habits and attitudes are learned, and one's parents and peers are very instrumental in this process. If his parents are active Republicans and frequently speak disparagingly about the Democrats, a child is likely to voice similar views long before he has any

clear understanding of politics and political parties. Similarly, if a child's parents often speak of a particular ethnic group in disparaging terms, he is likely to adopt these negative attitudes even if he has had no direct contact with any member of that ethnic group.

The attitudes held toward members of a social group affect the attitudes that the group members hold toward themselves. This has been shown very clearly in the case of the attitudes of Negroes toward themselves. By the time Negro children reach elementary school age they have begun to adopt the same negative views of Negroes, and therefore of themselves, that others have displayed. Many already view light-skinned dolls as "better" than dark-skinned dolls, and frequently express dissatisfaction with their own coloring. Thus, what we are faced with as a society is not only modifying the attitudes of non-Negroes toward Negroes, but also modifying the attitudes of many Negroes toward themselves.

Concluding comments

Several areas of work by social psychologists have not been considered here because they are given considerable attention in the text. Outstanding among these is the topic of *attitude* formation and change, considered at length in Chapter 8. Others include the use of *sociometric techniques* to study interpersonal relationships within groups, and the topic of *leadership*, both considered in Chapter 9.

Section 9

STATISTICS

Descriptive statistics

Statistics provide a means of describing observations in a way that will make them more understandable. This section will provide a brief overview of those areas of statistics which are of most concern to teachers. First of all, suppose that we have administered four tests to a group of high-school students and the data we have obtained consist of the test scores shown in Figure 1. As they are shown here, these scores are not particularly meaningful. That is, without some further treatment it is difficult to get a very good picture of how the class performed as a whole, how particular individuals did in relation to one another, what interrelationships exist among the four sets of scores, etc. There are a number of ways in which statistical techniques can be useful in this respect, and we shall consider some of these here. Keep in mind that these or similar techniques can be used whether the data consist of test scores, speeds of running, measures of height, or other kinds of measurements.

FIGURE 1: RAW SCORES FOR FOUR TESTS OF A RANDOM SAMPLE OF FORTY THIRTEEN-YEAR-OLDS¹

BOYS					GIRLS				
Code number of male student	Kuder Preference Record: Literary interest score	California Achievement Test: Reading comprehension score	California Test of Mental Maturity: Verbal score	California Test of Mental Maturity: Maturity rating	Code number of female student	Kuder Preference Record: Literary interest score	California Achievement Test: Reading comprehension score	California Test of Mental Maturity: Verbal score	California Test of Mental Maturity: Maturity rating
1.	18	63	52	1.19	1.	21	59	47	1.16
2.	24	62	48	1.25	2.	26	71	52	1.04
3.	8	47	38	.84	3.	26	70	55	1.13
4.	18	62	50	1.18	4.	27	61	49	1.07
5.	16	61	41	.97	5.	22	55	35	.96
6.	24	62	51	.96	6.	12	66	48	1.10
7.	6	62	50	1.14	7.	25	67	43	1.16
8.	24	62	49	1.13	8.	19	65	42	.93
9.	11	59	43	1.02	9.	16	55	42	1.08
10.	14	62	47	1.18	10.	28	62	51	1.25
11.	21	65	41	1.10	11.	20	54	43	1.15
12.	13	59	48	.99	12.	11	74	53	1.08
13.	9	77	56	1.28	13.	22	66	53	1.10
14.	12	60	57	1.25	14.	27	74	47	1.13
15.	6	65	46	1.17	15.	21	52	45	1.05
16.	22	78	57	1.37	16.	18	64	55	1.15
17.	6	70	52	1.25	17.	30	50	53	1.12
18.	8	62	50	1.08	18.	24	64	55	1.21
19.	18	62	37	1.03	19.	18	60	42	.89
20.	24	59	40	1.03	20.	12	65	43	1.04

¹Data published through the kind permission of Riverside-Brookfield High School, Riverside, Illinois.

Frequency distributions Various means of arranging the data on the California Achievement Test from Figure 1 are shown in Figure 2. One simple step toward making the data more meaningful is to list, in order, all possible scores from the highest to the lowest obtained, and then to tabulate the frequency with which

Now, consider the role of the "middle man" in the case where other members can communicate with each other only through him. When the task facing the group is complex and difficult, the pressures tend to be concentrated on one person rather than shared by all, as in the case of unrestricted communication.

Most research of this sort has been conducted with small, artificially created groups (generally comprised of no more than six to eight members). Thus the results cannot be generalized to groups of all sizes or for all purposes.

Interaction analysis A technique called *interaction process analysis* developed by Bales (1950) has proven useful in studying interaction among members of committees or other decision-making groups. All socially-relevant behavior is classified in one of several (often 12) specific categories, including, for example, "shows solidarity," "gives opinion," "asks for suggestions," and "shows antagonism." These specific categories can be grouped into four general categories: positive reactions, problem-solving attempts, suggestions, and negative reactions. An experienced observer simply makes entries under the appropriate specific categories, then these are added to show the relative frequency of various classes of interactions. Such nonverbal behavior as grimacing, desk-pounding, and smiling are considered along with actual vocalizations.

Based on research using the above techniques, Bales (1954) has offered a number of recommendations regarding the formation and activity of committees. For example, he suggests that one avoid appointing committees of more than seven members, that free communication among all members be encouraged, and that selection of either very high or very low participators be avoided.

The Bales procedure has been modified for use in studying teacher-pupil interactions. This approach has been discussed in Chapters 1 and 13 of your text. One of its major purposes is to relate various classroom interaction patterns to criteria such as student satisfaction and achievement. It may also prove useful for the teacher's evaluation and modification of his own behavior.

Group vs. individual productivity What is the relative productivity of individuals working alone and in groups? Will the problem solution reached jointly differ in quality from the solutions that would have resulted from independent work? These socially important questions have generated some extremely interesting research.

It is clear that the relative productivity of groups and individuals depends in part both on the nature of the task and the nature of the individuals involved. In cases where solution of the problem requires that several diverse technical skills be brought to bear, specialists in these different areas are likely to do better in a group. Frequently, however, individual performance is either as good as or better than group performance. A typical approach is to compare the problem solutions of four or five individuals working independently with the single solution agreed upon by the same number of persons working together. In many cases (a) the quality of the group solution is similar or slightly superior to the *average* quality of individual solutions, and (b) the group solution is inferior to the *best* of the individual solutions. Particularly where there is a premium on originality, the group appears to exercise an inhibitory effect on the most original of its members.

each score occurs. A *simple frequency distribution* of the California Achievement Test Scores is shown in the third column of the figure. Note how much more informative the data are when presented this way, as compared with the listing of scores in the first column.

When the *range* of the data is large; that is, when the highest and lowest scores are widely separated, it may be helpful to group the data. A *grouped frequency distribution* is shown in the last column of Figure 2. The grouping of data is often a practical necessity. For example, if one were making a frequency distribution showing the annual income of residents of a particular city, it would not be feasible to list every possible income figure. Instead, one would show the number of persons whose income falls within certain intervals (e.g., \$3000-\$5000).

Often it is helpful to present a frequency distribution in the form of a graph. Three of the several ways this can be done are shown in Figure 3. With a quick glance at these displays one can see that most of the students scored near the middle of the distribution, and that the distribution of scores is nearly symmetrical; that is, the left side of the distribution is nearly a mirror image of the right.

Central tendency A familiar statistical concept that is useful in describing data is the *average*. The most common type of average is the *mean* or *arithmetic average*. The mean, symbolized by $\bar{X}$, is obtained by summing the observations and dividing this sum by the number of observations made. For example, the sum of all 40 California Achievement Test scores is 2513. Dividing this number by the number of students (40), we find that the mean score is 62.83.

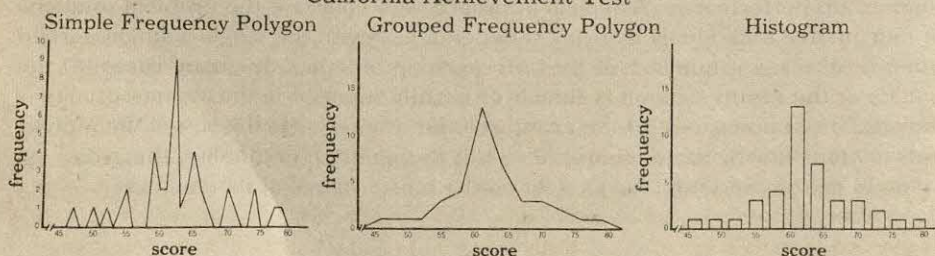
The *median* is a second measure of central tendency that is often used. The median is the middle score in a distribution, i.e., the score which divides the distribution exactly in half. It can be determined easily by listing all scores in order from highest to lowest, then counting up to or down to the middle. The median of the California Achievement Test scores is 62.

A less frequently used statistic is the *mode*, or most frequently obtained score. The mode can be obtained very quickly, simply by inspecting a frequency distribution. In the case of the California Achievement Test data the mode is 62.

Note that these three approaches yielded almost identical results (62.83, 62, and 62). This will be true whenever we are dealing with symmetrical distributions in which most scores are near the middle. However, consider what would happen if the four students with scores of 59 had, instead, obtained scores of 10. Neither

FIGURE 3: DISPLAYING SCORES MEANINGFULLY

Ways of graphing reading comprehension scores on the California Achievement Test



the median nor the mode would be affected—they would remain at 62. On the other hand, the mean would change considerably, in that the sum of the scores would now be 2317. Dividing by 40 we find a mean of 57.92. Thus, the mean is sensitive to extreme scores while the median and mode are not. Sometimes a better overall picture can be obtained by calculating both the mean and the median. Consider this extreme example concerning the average income of three brothers. One, a successful executive, earns \$27,000 per year. The annual incomes of the others are \$5000 and \$4000 respectively. What is their average annual income? It is \$5000 using the median, but \$12,000 using the mean. The student should be sensitive to the possibility of being misled by reports of averages.

Variability Usually it is desirable to obtain a more complete picture of the data than is given by the measure of central tendency. It is particularly helpful to know how widely dispersed the scores are—how much they vary. The simplest index of variability is the *range*. This is obtained simply by subtracting the lowest from the highest score. For the California Achievement Test data the range is $78 - 47 = 31$.

The standard deviation (σ) is a more commonly used index of variability. The standard deviation is based upon the degree to which individual scores deviate from the mean of the scores. If all the scores are clustered together, the deviations are small and so is σ . If scores are scattered widely, the deviations will be great and σ will be correspondingly large. One procedure for calculating the standard deviation is shown in Figure 4. Note that the first step is to translate each obtained score into a deviation score, which is simply the difference between a score and the mean of all the scores. Then, each deviation score is squared, and the sum of the squared deviations is divided by the total number of scores (N) to obtain the *variance* (σ^2). Finally, the standard deviation is obtained by finding the square root of the variance.

The normal curve and standard scores Many of the measures with which psychologists deal are *normally distributed*. That is, the distribution is symmetrical and most individuals are clustered close to the mean. Figure 5 shows a *normal curve* and several characteristics of such a distribution. Note that when test scores (or other measures) are distributed in this fashion we can get a very accurate picture of an individual's performance relative to others if, besides his score, we also know the mean and standard deviation of the total distribution. For example, suppose that the mean and standard deviation on Test A are 46 and 8 respectively. We can see from the figure that about 68 per cent of all the scores fall within one σ of the mean; thus we know that about 68 per cent of the examinees score between 38 and 54 on Test A. Only about 16 per cent score above 54, about 2 per cent score above 62, etc. Thus, for example, if a student obtains a score of 30, we know that he is in the bottom 3 per cent.

Scores obtained on a given test—*raw scores*—are more meaningful if these are converted into scores that take into account the mean and standard deviation of the total distribution. Such scores are termed *standard scores*, and one example of these is the *z score*. An individual's *z score* is simply the number of standard deviations that person's raw score is above or below the mean. Suppose an individual obtains a raw score of 54 on Test A. Since 54 is exactly one standard deviation above the mean, his *z score* is 1.00. If his raw score had been 42, or one half a

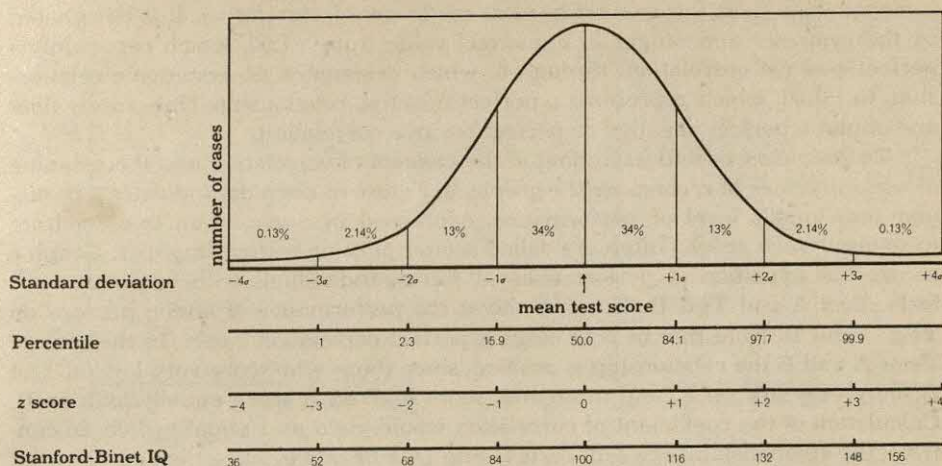
FIGURE 4: CALCULATING THE STANDARD DEVIATION
Calculations based on reading comprehension scores on the
California Achievement Test.

X	f	x	x ²	fx ²
78	1	15.17	230.13	230.13
77	1	14.17	200.79	200.79
76	0	13.17	173.45	0
75	0	12.17	148.11	0
74	2	11.17	124.77	249.54
73	0	10.17	103.43	0
72	0	9.17	84.09	0
71	1	8.17	66.75	66.75
70	2	7.17	51.41	102.82
69	0	6.17	38.07	0
68	0	5.17	26.73	0
67	1	4.17	17.39	17.39
66	2	3.17	10.05	20.10
65	4	2.17	4.71	18.84
64	2	1.17	1.37	2.74
63	1	.17	.03	.03
62	9	-.83	.69	6.21
61	2	-1.83	3.35	6.70
60	2	-2.83	8.01	16.02
59	4	-3.83	14.67	58.68
58	0	-4.83	23.33	0
57	0	-5.83	33.99	0
56	0	-6.83	46.65	0
55	2	-7.83	61.31	122.62
54	1	-8.83	77.97	77.97
53	0	-9.83	96.63	0
52	1	-10.83	117.29	117.29
51	0	-11.83	139.95	0
50	1	-12.83	164.61	164.61
49	0	-13.83	191.27	0
48	0	-14.83	219.93	0
47	1	-15.83	250.59	250.59
Σf = N = 40			Σfx ² = 1729.82	

$$\begin{aligned}\sigma^2 &= \frac{\Sigma fx^2}{N} \\ \sigma &= \sqrt{\frac{\Sigma fx^2}{N}} \\ &= \sqrt{\frac{1729.82}{40}} \\ &= 6.58\end{aligned}$$

σ = the standard deviation
 σ^2 = the variance
X = the value of a raw score in the series of measures
x = the deviation of a score from the mean of its distribution
 x^2 = the deviation of a score from the mean of its distribution squared
 Σ = the sum of
f = the frequency with which each value appears in the series of measures
 Σfx^2 = the sum of the squared deviation scores
N = the number of measures

FIGURE 5: THE NORMAL DISTRIBUTION



standard deviation below the mean, his *z* score would have been $-.50$. The notion of standard score and the relation among various types of standard scores may be clarified by examining Figure 5.

The most striking advantage of using standard scores is that such a score indicates an individual's performance relative to others with whom he is being compared. They also are particularly helpful when one individual's performance on several different tests is being compared. Suppose that an individual receives raw scores of 40, 50, and 60 respectively on tests of reading, spelling, and arithmetic. Does this mean that he is best in arithmetic and worst in reading? One cannot tell without knowing what the range of scores was on the three tests and how other students performed. However, if you are told that the person received *z* scores of .50 in reading, 1.00 in spelling, and $-.50$ in arithmetic, it is clear that his performance was relatively highest in spelling and lowest in arithmetic.

Percentiles Educational test scores often are converted into percentile scores. An individual's percentile score indicates what percentage of all examinees scored lower than he did. Thus, an individual scoring at the 80th percentile has done as well as or better than 80 per cent of those with whom he is being compared. Figure 5 shows the relation between percentiles and the various standard scores in the case of a normal distribution.

Correlation Sometimes an investigator is interested in knowing whether different characteristics are related. For example, he might want to know whether those who are tall also tend to have good vocabularies—or whether those who do well in school also do well in sports. If he found that the tallest children also had the largest vocabularies, he would report a *positive* correlation between height and vocabulary—as one variable increases so does the other. On the other hand, if he found that those who did best in school were worst in sports, he would report a *negative* correlation, one in which one variable decreases as the other increases—an inverse relationship. If no consistent relationship exists, the correlation is said to be zero.

One technique of measuring the relationship between two sets of data on the same subjects gives the *product-moment coefficient of correlation*. It is designated by the symbol r and ranges in numerical value from $+1.00$, which represents a perfect positive correlation, through 0 , which designates no systematic relationship, to -1.00 , which represents a perfect negative relationship. Only rarely does one obtain a perfect negative or perfect positive correlation.

To get a clearer understanding of the concept of correlation and the meaning of various values of r , consider the graphs in Figure 6. Each dot indicates a particular individual's level of performance, expressed in z -scores, on two separate measures. Such graphs often are called *scatter plots* or *scatter diagrams*. Graph *a* shows the hypothetical performance of fifteen individuals with respect to two tests, Test A and Test B. Graph *b* shows the performance of fifteen persons on Test C and D. Note that in both cases a perfect correlation exists. In the case of Tests A and B the relationship is positive, since those who score very low on Test A score very low on B, and those who score high on A score equally high on B. Calculation of the coefficient of correlation would yield an r equal to 1.00 . In contrast, the relationship between Tests C and D is negative, since high scores on C are low scores on D, and vice versa. The resulting r would be -1.00 .

In practice, psychological measures do not correlate so strongly with one another. Graphs *c-f* in Figure 6 show the kinds of relationships that are more likely to be found.

Correlation is an extremely useful concept for prediction. If a high positive correlation is found between success on a certain aptitude test and success in college, the test becomes a predictive tool for judging the likeliness that a given individual will make a successful college student. The numerical expression of a correlation is called a *coefficient of correlation*. Predictive power in such an instance rarely exceeds a validity coefficient of $.70$, which means that the correlation between predicted and subsequent actual performance is not perfect. Nor does an r of $.70$ mean that the prediction is "70 per cent accurate." It is more complicated than that. If a correlation of $.70$ is found between two measures, the degree of overlap or commonality in what these are measuring is found by squaring the coefficient of correlation, i.e., r^2 , rather than r . In the above case, then, the degree of similarity in what the two tests are measuring is $.70^2$ or $.49$; i.e., there is about 50 percent overlap.

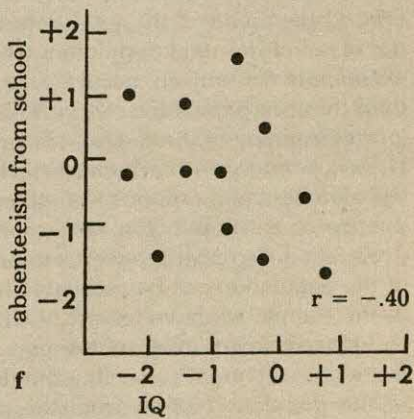
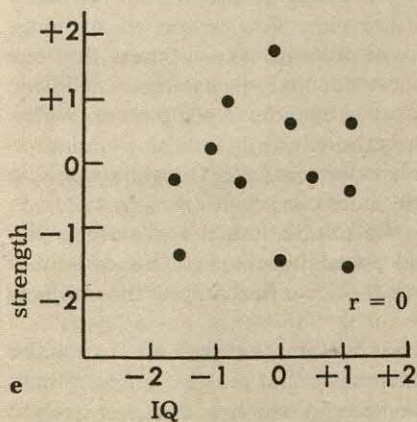
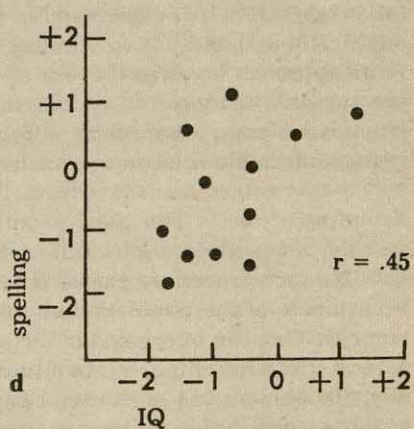
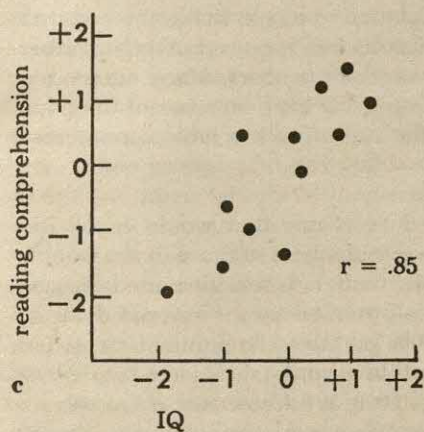
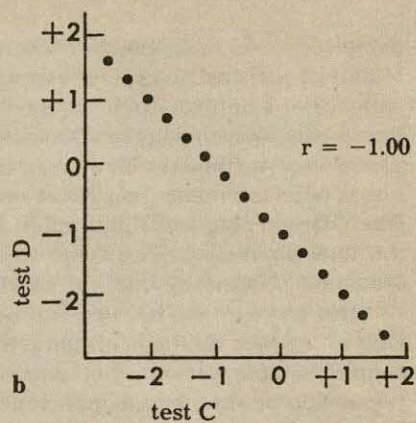
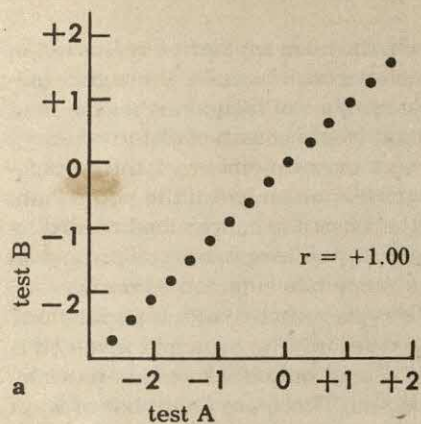
A high positive correlation, however, does not mean that one variable is causing the other. Correlation refers only to the relationship and *does not imply causality*. Thus, one would not attribute high vocabulary to height if they were found to be positively correlated in a group of first-graders; there might be a third variable to which the positively correlated variables are both related. In this case, both might be the result of physical maturity in young children.

While a classroom teacher may seldom compute a correlation coefficient, there are times when such a computation will be desirable. For instance, it might be of interest to calculate the relationship between standings on the midterm and the final examination. Appropriate formulas and instructions for this purpose can be found in nearly any textbook dealing with statistics or measurement.

Sampling and inference

In addition to simple description, statistical procedures often are used to estimate

FIGURE 6: SAMPLE CORRELATIONAL SCATTER PLOTS



characteristics of some large group—say all high-school freshmen—on the basis of the characteristics of a sample drawn from that group.

Sampling In the context of scientific research, the term *population* refers to the totality of persons, objects, or events about which we wish to make some generalization. For example, if we are interested in the number of factual errors made in introductory psychology textbooks, our population would consist of all introductory psychology textbooks. However, examination of every member of the population is often impractical, so we examine only a portion or *sample* of the population. The characteristics of this sample constitute the basis for conclusions regarding the total population. The same idea is involved in public-opinion polling and in obtaining “Nielsen ratings” of TV programs, to name two common examples.

But how can we be sure that our sample is representative of the population? One of the best methods of doing this is *randomization*. The principle involved is simple. Sampling from a population is random if, and only if, all members of the population have an equal opportunity to be selected. There are a number of ways in which this situation can be achieved. One familiar approach is to put the name (or a code symbol) of each member of the population in a box, shake the box thoroughly, then “blindly” draw out as many names as are required. A less cumbersome approach involves the use of a *table of random numbers*. Many such tables are available; they consist of long series of numbers. If each member of the population is assigned a particular number, then the use of such a table constitutes a quick and simple selection procedure.

Sampling error The ideal sampling procedure is one that would result in a sample whose mean and standard deviation were identical to those of the population. No such procedure exists. What is possible, though, is to determine how good an estimate of the population characteristics is provided by the sample data. Assume that we are interested in the scores of 1000 persons (the population) on Test B, and that our approach is to administer Test B to a randomly selected sample of, say, 100 persons out of the total population of 1000. We know that if we were to make several different random sample selections, the means of these samples would not be identical. Instead, the *sample means* would be distributed normally around the mean of the total population, or *true mean*. Now, when we estimate the mean of the total population from the mean of our sample, we know that our estimate is not entirely accurate. It may be somewhat higher or somewhat lower than the true population mean. This kind of error is called *sampling error*. A major determinant of the degree of sampling error is the variability of the population. If we are interested in a characteristic for which there is little variability among the members of the population, then our sample data will provide a very accurate picture of the population. The more variable the population, the greater is the probable difference between sample mean and population mean. The variability of the population can be estimated from the variability we find among the subjects in the sample we have tested.

Once the variability of the population has been estimated, we can then make a precise statement regarding the degree of inaccuracy that exists in our estimate of the population mean from the mean of our sample. Such a statement might read “The probability is .98 that the population mean is within five points of our obtained sample mean.” Of course, the greater the size of the sample, the more

similar to the population the sample will be, thus the more accurate will be our estimates regarding the population.

Statistical inference Keeping in mind the concept of sampling error, let's consider the use of statistical procedures in psychological and educational experimentation. Assume that we are interested in the relative effectiveness of two instructional approaches in reading (Methods A and B) with the 50 first-grade students in some particular school. Accordingly, these 50 students are divided randomly into two groups of 25 students each. Method A is used with one group and Method B with the other. Suppose that at the conclusion of the experiment we find that the mean reading test scores are 45 for Method A and 50 for Method B. Now, if we stopped here and concluded that Method B was superior to Method A we would be running the risk of quite a serious error. This is because it is possible that the two groups would have differed as much as five points just due to chance, even if they had received identical instruction in reading.

There are two sources of such chance differences. One is the imperfection inherent in the test of reading that was employed. Most measuring devices used in education and psychology are less than 100 per cent accurate or *reliable*, resulting in *errors of measurement*. Thus, it is likely that some of the difference between the two groups is due to these errors of measurement. The second factor takes us back to the earlier discussion of sampling error. The point here is that random procedures for the assignment of subjects to groups do not result in exact equivalence of the groups. If the 50 children were randomly divided into two groups ten successive times, we would obtain ten somewhat different results in terms of the differences between the groups.

The experimenter is faced with the question of whether the difference of five points between the two sample means was produced by the instructional differences or whether they were due simply to chance (i.e., a combination of test unreliability and sampling error). At this point, statistical procedures generally are used to assist in reaching a decision. The approach is a sort of process of elimination. Statistical procedures or tests are available which allow the experimenter to estimate the likelihood that a difference as large as that obtained (five points in this case) was the result of chance. If chance can be eliminated as a probable cause, then there is only one possibility left, namely, that Method B really did result in superior reading performance.

The result of a statistical test applied in such situations is a statement regarding the probability that a difference as great as that obtained was due entirely to chance. When that probability is very low (less than .05 or .01, customarily), the difference is said to be *statistically significant*. This simply means that the difference is accepted as being due to the experimental manipulations (e.g., different instructional methods) rather than just to chance. Of course, the investigator cannot be absolutely certain that his decision is correct, but the odds are strongly in his favor.

There are a variety of statistical tests available. These include the *t* test, the *F* test, the chi-square test, and many others. The particular test employed depends on the precise nature of the situation. We will make no effort at a more detailed description or discussion in this area. The important point for one who will be reading reports of research findings is to understand why statistical tests are used and how to interpret the outcomes of such tests.

ACKNOWLEDGMENTS

Sources of illustrations are listed below except for charts and diagrams based on research. In those cases documentation is included in the list of references which begins on page 599.

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Cornell Capa—Magnum (right).
316 Don Stebbing.
367 Hays—Monkmeyer.
406 Sybil Shelton—Monkmeyer.
427 Sybil Shelton—Monkmeyer.
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506 Reproduced by permission of the Board of Education, City of Chicago (top). Courtesy of the Office of Information, Niles Township High Schools, Skokie, Illinois (bottom).
508 Hugh Rogers—Monkmeyer (left). Hays—Monkmeyer (right).
541 Drawings by Arnold Chalfant.
546 NASA.
555 Courtesy of Charles Pfizer & Co., Inc.
569 U. S. Air Force—Aerospace Medical Research.

Task 1 Solutions



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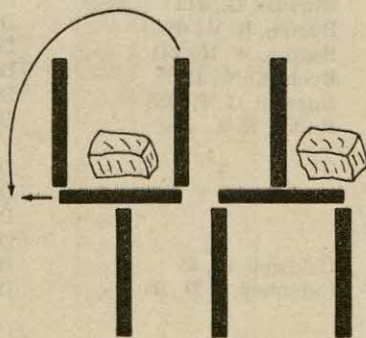
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Task 6 Solutions

1. Never.
2. 5:25. You figure that if the wife had ten minutes less driving than usual, she must have been five minutes from the station when she met her husband.
3. Chuck, the future lawyer, sat in the middle and got the vanilla milkshake. Reason this way: Bill had only one neighbor; therefore he must have been on the end, and the person who ordered the vanilla milkshake was in the middle. If the law student sat next to the person with the strawberry milkshake, he must have been in the middle. The law student was neither Bill (who sat at the end) nor Al, so he must have been Chuck.
4. Move the clips in the manner indicated in the left-hand diagram, to re-form the goblet in the position shown at the right.



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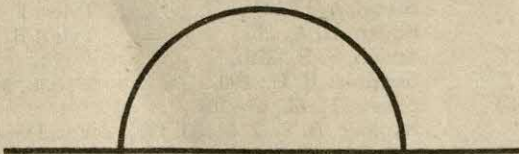
Task 7 solutions

1. The missionary story is from a Plot Titles Test. Responses are scored as clever or non-clever. Examples of nonclever titles: *African Death*, *Defeat of a Princess*, *Eaten by Savages*, *Boiled by Savages*. Examples of clever responses: *Pot's Plot*, *Stewed Parson*, *Gail or Boil*, *A Mate Worse than Death*, *He Left a Dish for a Pot*, *Chaste in Haste*, *A Hot Price for Freedom* (Guilford, 1959).

2. The lines you embellished were from a drawing completion test designed to reveal creativity. Below are three responses to it. The first is a typical response of a subject chosen at random. The others are responses of creative individuals (Barron, 1958).



Now embellish the figure below in any way you wish. Then turn back to page 260 and continue reading.



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